

NBER WORKING PAPER SERIES

INDIA TRANSFORMED? INSIGHTS FROM THE FIRM LEVEL 1988-2005

Laura Alfaro
Anusha Chari

Working Paper 15448
<http://www.nber.org/papers/w15448>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
October 2009

We thank our discussant Robert Lawrence, Arvind Panagariya, participants at the Brookings India Policy Forum conference in New Delhi, Rawi Abdelal, Lakshmi Iyer and Richard Vietor for helpful comments. We thank T.C.A. Madhav Raghavan for excellent research assistance. We are also grateful to Jens Arnold, Beata Javorcik, Molly Lipscomb, Aaditya Mattoo, and Petia Topolova for sharing with us their data on services and trade liberalization. The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2009 by Laura Alfaro and Anusha Chari. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

India Transformed? Insights from the Firm Level 1988-2005

Laura Alfaro and Anusha Chari

NBER Working Paper No. 15448

October 2009

JEL No. F4,O12

ABSTRACT

Using firm-level data this paper analyzes the transformation of India's economic structure following the implementation of economic reforms. The focus of the study is on publicly-listed and unlisted firms in manufacturing and services industries. Detailed balance sheet and ownership information permit an investigation of a range of variables. We analyze firm characteristics shown by industry before and after liberalization and investigate how industrial concentration, number, and size of firms evolved between 1988 and 2005. We find great dynamism displayed by foreign and private firms as reflected in the growth in their numbers, assets, sales and profits. Yet, closer scrutiny reveals no dramatic transformation in the wake of liberalization. The story rather is one of an economy still dominated by the incumbents (state-owned firms) and to a lesser extent, traditional private firms (firms incorporated before 1985). Sectors dominated by state-owned and traditional private firms before 1988-1990, with assets, sales and profits representing shares higher than 50%, generally remained so in 2005. The exception to this broad pattern is the growing importance of new private firms in the services sector. Rates of return also have remained stable over time and show low dispersion across sectors and across ownership groups within sectors.

Laura Alfaro

Harvard Business School

Morgan Hall 263

Soldiers Field

Boston, MA 02163

and NBER

lalfaro@hbs.edu

Anusha Chari

301 Gardner Hall

CB#3305, Department of Economics

University of North Carolina at Chapel Hill

Chapel Hill, NC 27599

and NBER

achari@unc.edu

1. Introduction

“Is there some action a government of India could take that would lead the Indian economy to grow like Indonesia’s or Egypt’s? If so, what exactly? If not, what is it about the ‘nature of India’ that makes it so?”

R. E. Lucas Jr. (Marshall Lecture, Cambridge University, 1985).

According to World Bank estimates, between 1960 and 1980, India’s growth rate remained at an unspectacular average of 3.5% per annum. It was in the mid-1980s that it began accelerating, culminating in a rate of over 9% per annum by 2005. In fact, India’s average growth rate over the entire period between 1986 and 2005 surpassed those of both Indonesia and Egypt (see Table A).

Numerous views are put forth about the driving forces behind the transformation of India’s growth landscape.¹ While Rodrik and Subramanian (2005) point out that growth initially accelerated during the 1980s, and attribute it to the role of “pro-business” reforms that began in the early 1980s, Bosworth, Collins, and Virmani (2007) argue that the emphasis on the services sector as the driving force behind the expansion of the Indian economy is perhaps exaggerated as it represents only a small share of the country’s overall employment level. Panagariya (2004) argues that piecemeal external liberalization, along with small spurts of domestic deregulation on a variety of margins and expansionary policies, combined to produce a small shift in the growth rate in the 1980s.² He also contends that the systemic reforms in the 1990s and 2000s were essential to both sustaining and accelerating the growth rate. Srinivasan and Tendulkar (2003), on the other hand, view fiscal expansion and excessive foreign borrowing that precipitated the balance of payments crisis in 1991 as the primary cause of the shift in the growth rate in the 1980s but also note that this growth rate would have been unsustainable without the subsequent reforms.

The debate is far from settled. Thus far the extensive empirical literature has focused on characterizing India’s aggregate economic performance. However, aggregate data do not shed light on the channels through which policy reform can transform the economy at the micro-level. Data at the firm-or-plant level would offer an opportunity to do so. This paper takes a step in this direction by documenting detailed stylized facts about the evolution of India’s micro-economic industrial structure against the backdrop of the reforms that began in the mid-1980s.³

¹ See Bosworth, Collins and Virmani (2007), Kochar et al. (2006), Panagariya (2008), Rodrik and Subramanian (2005) and references therein.

² At 1999-2000 prices, the annual growth rate shifted from 3.2 percent between 1965-66 and 1980-81 to 4.6 percent between 1981-82 and 1987-88 with end-point years included in the calculations (Panagariya, 2004).

³ The reform process, albeit piecemeal in nature, began in the mid-eighties. Data limitations prevent us from describing changes in firm-activity for the period before 1988.

The end of the license Raj and implementation of pro-market reforms had far-reaching implications for changes in India's industrial structure. Significant sectors of the economy were opened up for private participation. India began to integrate into the world economy: import licensing was abolished in many sectors, import duties were sharply reduced, and many restrictions on FDI were lifted.⁴ Investment increased from 23% of gross domestic product (GDP) in 1985 to 38% in 2005. During the eighties, total foreign direct investment (FDI) inflows barely reached one billion dollars. In contrast, India attracted more than \$70 billion in FDI between 2000 and 2005, the bulk of which was concentrated in the services, computer software and hardware, construction, and telecommunications sectors. New firms emerged and many Indian firms established an international presence. The economy transitioned from being mainly dependent on agriculture and manufacturing to a services-oriented one over the 1990s.⁵

Liberalizations, broadly defined to include trade and entry liberalization, regulatory reform, and privatization, are believed to transform economies via more competition (domestic and foreign), the removal of distortions in relative prices and access to finance. The effects of liberalization processes, however, may not be uniform.⁶ Some industries may be better equipped to change than others. Within industries, new entrants may gain market share, while incumbents go bankrupt. Restrictions may linger in some sectors, and for some firms.

Until recently, studies about firm-activity in the context of policy reform have predominantly focused on developed rather than developing economies—data availability being an obvious constraint (see Tybout, 2000).⁷ Firms in developing countries often face a variety of constraints such as over-regulation and the underdevelopment of financial markets. These are glaring constraints affecting the ease with which resources can be reallocated across sectors and within firms. Liberalization policies in many developing countries have relaxed some of these constraints and changed the environment in which firms operate. These reforms provide an ideal backdrop against which to investigate the firm-level response to a changing economic environment.

⁴ Section 3 describes the main industrial reforms which include privatization, trade and FDI deregulation, and delicensing or domestic deregulation; financial reforms include banking sector deregulation allowing foreign bank entry, stock market liberalization, exchange rate deregulation, and capital account liberalization; corporate governance reforms including setting up of a regulatory body (SEBI), regulations concerning listing requirements, insider trading laws, protection of minority shareholders, board membership rules, executive compensation rules, etc.

⁵ Manufacturing as a share of GDP had increased only marginally over the past three decades, from 22% in 1980 to 27% in 2006. Restrictive labor laws, and moderate corporate investment hampered this sector.

⁶ As Alesina et al. (2005) note, the theoretical effects of regulatory reform (entry liberalization and privatization) are ambiguous. Reforms that imply reduction in entry barriers and in the markup are likely to lead to an increase in investment; aspects of deregulation that remove binding constraints on rates of return may determine a reduction of investment. Similarly, the effects of privatization are also ambiguous.

⁷ Bertrand and Kamarz (2002), for example, study the expansion decisions of French retailers following new zoning regulations in France. Black and Strahan (2002), and Guiso, Sapienza, and Zingales (2004) find that competition in the banking sector and financial development fosters firm-entry in the U.S. and Italy.

The aim of this paper is to describe the evolution of India's sectoral composition by focusing on the micro-foundations of its productive structure. How has India's industrial structure evolved at the firm level as a result of the reforms? What was the industrial composition by ownership before and after reforms? Has the influence of traditional incumbents such as state-owned firms changed? If so, what is the emerging role of private, domestic and foreign firms? What has happened to firm size and industry concentration following liberalization?

We present a series of detailed stylized facts about the characteristics of firms evidenced by industry before and after the reforms of 1991.⁸ We use firm-level data from the Prowess database collected by the Centre for Monitoring the Indian Economy from company balance sheets and income statements. Prowess covers both publicly-listed and unlisted firms from a wide cross-section of manufacturing, services, utilities, and financial industries from 1988 until 2005. About one-third of the firms in Prowess are publicly-listed firms. The companies covered account for more than 70% of industrial output, 75% of corporate taxes, and more than 95% of excise taxes collected by the Government of India (Centre for Monitoring the Indian Economy). Prowess covers firms in the organized sector, which refers to registered companies that submit financial statements.⁹

The main advantage of firm-level data is that detailed balance sheet and ownership information permit an investigation of a range of variables such as sales, profitability, and assets for an average of more than 15,500 firms across our sample period. Firms are classified across 109 3-digit industries covering agriculture, manufacturing and services, which is an additional advantage of our data over existing work focusing only on the manufacturing sector.¹⁰ The data are also classified by ownership categories such as state-owned, private business-group-affiliated firms, private stand-alone firms and foreign firms. Note that private refers to firms in the private as opposed to the public sector, and many firms in the private sector are publicly traded. We study five sub-periods 1988-1990; 1991-1994; 1995-1998; 1999-2002 and 2003-2005.¹¹ These periods broadly match the different liberalization waves explained in detail in the text.

We present, specifically, information in detail about the average number of firms, firm size (assets, sale) and profitability (profit before interest depreciation and taxes and return on assets) for all firms in our sample by sector as well as by category of firm: state-owned enterprises, private firms

⁸ Formal econometric analysis establishing causal linkages is left to future work.

⁹ Section 4 describes in detail the advantages and shortcomings of the dataset.

¹⁰ As Goldberg et al. (2009) note, unlike the Annual Survey of Industries (ASI), the Prowess data is a panel of firms, rather than a repeated cross-section, and therefore, particularly well suited for understanding how firms adjust over time and how their responses may be related to policy changes.

¹¹ Although the liberalization process has been gradual, and the pattern of foreign-entry liberalizations (and more general reforms) driven by private interests (see Chari and Gupta 2008), this does not preclude the analysis of the effects of reducing these constraints on the evolution of the firm-size distribution.

incorporated before 1985 (old private firms), private firms incorporated after 1985 (new private firms), and foreign firms for the five sub-periods. Sales, size, entry, profitability, and overall firm-activity are disaggregated measures of economic growth and proxies of efficiency, and thus provide an understanding of the effectiveness of reforms. We also look at market dynamics with regard to promotion of competition in order to understand the efficient allocation of resources. We measure the degree of competition (consolidation) as a measure of competitive efficiency to examine how industrial concentration has evolved over time.

The data show great dynamism on the part of foreign and new private firms (incorporated after 1985) as reflected in their growth, that is, in numbers, assets, sales and profits. However, on closer examination, what emerges is not a story of dramatic transformation in India's micro-economic structure following liberalization. Rather, the data suggest an economy still dominated by the incumbents, state-owned firms, and to a lesser extent, the traditional private firms, that is, those firms that existed before the first wave of reforms. We find evidence of continuing incumbent control in terms of shares of assets, sales and profits accounted for by state-owned and traditional private firms. In sectors dominated by state-owned and traditional firms before liberalization (with shares higher than 50%), these incumbents remain the dominant ownership group following liberalization. Interestingly, rates of return remain remarkably stable over time and show low dispersion across sectors and across ownership groups within sectors.

The exception to the pattern of incumbent firm dominance is seen in the growth of private firms in the services industries. In particular, the assets and sales shares of private new firms in business and IT services, communications services and media, health and other services show a substantial increase in growth and in shares over this period. This fact coincides with the reform measures that took place in the services sectors after the mid-1990s and is also consistent with the growth in services documented in the aggregate data.¹²

Schumpeter (1942) argued that creative destruction, the replacement of old firms by new firms and of old capital by new capital, happens in waves. A system-wide reform or deregulation, such as the one implemented in India, may be the shock that prompts the creative destruction wave. Creation in India seems to have been driven by new entrants in the private sector and foreign firms. The sectoral transformation in India does not, however, seem to have gone through an industrial shake-out phase in which incumbent firms are replaced by new ones.¹³ Sectors in which state-owned enterprises and older

¹² In the case of information technology, pharmaceuticals and telecom, some new and very large players have emerged. Khanna and Palepu (2005) document the dynamism in the software industry.

¹³ Interestingly, many of the older firms (pre-independence) have by and large remained untouched by the reforms (not considering sectoral composition effects); see Table 8.

private firms dominated activity prior to liberalization continue to do so even twenty years after the reforms began.

Our findings are consistent with the observation in Topalova (2007), that there seems to be very little exit at the firm level in India's industry, with Goldberg et al.'s (2008) finding that net product creation following trade liberalization was almost exclusively driven by product addition as opposed to discontinuation of product lines, and with arguments in Panagariya (2008) about the slow transformation of the country following reforms.¹⁴ Different explanations may account for these findings such as lingering restrictions and regulation constraining firm flexibility to adjust and inefficiencies in the financial sector among others.¹⁵ However, one additional explanation, perhaps not sufficiently stressed in the debate, may be the important remaining role of incumbent (such as state-owned firms and firms incorporated before the reforms began). As emphasized in the political economy literature, entrenched incumbents firms may have incentives to oppose the liberalization efforts (Rajan and Zingales 2003a, 2003b). In fact, we find both industry concentration and state-ownership to be inversely correlated with the probability of liberalization. These results are consistent with the findings in Chari and Gupta (2008) focusing on FDI liberalization. Our conclusions suggest that trade liberalization in India was also inversely correlated with industry concentration.

Our work contributes to the literature that focuses on the study of different aspects of the recent evolution of the Indian economy, by analyzing in detail the evolution of firm activity by ownership, sector, and industry.¹⁶ In addition, it relates, more generally, to literature that emphasizes the effects of policy in the allocation of resources across establishments, by studying the effects of liberalization, particularly those that use firm-level data.¹⁷

The paper is organized as follows. Section 2 presents a review of the related literature. Section 3 describes the liberalization process in India. Section 4 describes the data while Section 5 presents the main empirical results. Section 6 carries the conclusion.

¹⁴ Goldberg et al. (2008) find little evidence of "creative destruction" and no link between declines in tariffs on final goods induced by India's 1991 trade reform and product dropping.

¹⁵ Banerjee (2006) notes that the banking sector in India, dominated by public sector-managed banks, fails to pull the plug on firms that ought to have been long shut down, and refers to practices of "ever-greening" of loans in the Indian banking system. Bloom and Van Reenen (2007) and Bloom, Sadun, and Van Reenen (2007) find that decision-making in Indian firms is highly centralized and management practices do not provide strong incentives for good performance. See also Khanna and Palepu (1999) for explanations put forth for the lack of product dropping in case studies on the product scope of Indian conglomerates.

¹⁶ Other recent work examines the effects of India's nineties liberalization with an emphasis on employment (see for example Besley and Burgess, 2004 and Aghion, Burgess, Redding, Zilibotti, 2008), bank lending (Cole, 2008), product-mix and imported intermediate inputs (Goldberg et al. 2008, 2009). These papers shed light on some of the impediments to the transformation of the economy (labor regulation, bank regulation, tariffs, and so on).

¹⁷ See Goldberg and Pavcnik (2004), Alfaro and Rodríguez-Clare, Harrison and Rodríguez-Clare (2009) for recent overviews of the studies on the effects of trade and FDI and Kose, Prasad, Rogoff, and Wei (2006) and Henry (2007) for the effects of liberalization on foreign capital.

2. The Lens of Firm-Level Data—Theory and Evidence from Related Literature

This study is related to different strands of research analyzing the recent performance of the Indian economy as well as the broad literature analyzing the impact of liberalization on investment, changes in the allocation of resources and economic growth. A thorough review of these large and diverse studies is clearly beyond the scope of this paper. We limit our attention to a few examples that particularly motivate our work.

2.1 Reforms and Firm-Activity

Theories emphasizing the role of “creative destruction” emphasize rapid output and input reallocation, product obsolescence and changes in productivity levels as necessary ingredients for the pace of reallocation playing an important role in aggregate productivity growth. Schumpeter (p. 83, 1942) describes “creative destruction” thus: “The fundamental impulse that keeps the capital engine in motion comes from the new consumers’ goods, the new methods of production and transportation, the new markets...[The process] incessantly revolutionizes from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact of capitalism. It is what capitalism consists in and what every capitalist concern has got to live in...” In addition to technological change, a system-wide reform or deregulation may prompt the creative destruction wave. Industries then go through a shake-out phase during which the number of producers decline in the industry, as incumbents and new entrants replace the firms that exit (Caballero and Hammour, 1996). Restructuring is one manifestation of creative destruction, by which the production structure weeds out unproductive segments, upgrades its technology, processes and output mix, and adjusts to the evolving regulatory and global environment.

In the case of India, theory suggests that the number of firms operating within industries can change through entry and exit in the face of deregulation. Therefore we expect that the ownership composition between incumbents and new entrants may change especially if unproductive incumbents are weeded out during an industrial shake-out phase and efficient new players enter the market. Theory also suggests a greater variability in observed rates of return and a decline in importance of unproductive incumbents (for example, declining market shares, assets, sales and profits).

2.1.1 Trade Liberalization and Firm-Activity

Recent work in trade using dynamic models with heterogeneous firms highlights the point that opening up trade leads to reallocations of resources across firms within an industry. Melitz (2003) provides a framework of monopolistic competition with heterogeneous firms that have become the

cornerstone of a growing literature, as the model yields rich predictions that can be confronted with the data. With exogenously determined levels of firm-productivity, the model predicts that opening up trade leads to changes in firm-composition within industries along with improvements in aggregate industry productivity: that low productivity firms exit; that intermediate productivity firms which survive contract; and that high productivity firms enter export markets and expand.¹⁸

Additionally, in a world of variable markets, import competition could have differential effects on firms of different productivities and pro-competitive effects through endogenous changes in mark-ups (Melitz and Ottaviano, 2003).¹⁹ More generally, changes in tariff and non-tariff barriers may affect the availability of foreign products on domestic markets and, hence, the elasticity of demand for domestic goods. Therefore we expect that in sectors liberalized to trade, incumbent firms may contract or exit the market. Moreover, only those new firms that are able to withstand competition from imports will enter and/or remain in the market. Examining concentration ratios and coefficients of variation in firm-size in industries that were liberalized to trade will allow us to examine this hypothesis.

Several studies have also focused on the effects of trade liberalization on indigenous firms and have uncovered substantial heterogeneity in firm performance within narrowly defined industries in both developed and developing countries (see Goldberg and Pavcnik, 2004). Trade liberalization has been found to have a positive effect in terms of efficient allocation of resources, i.e., higher output and productivity in manufacturing industries. In the case of India, Krishna and Mitra (1998) find that low-productivity plants contract and industry-level productivity increases following liberalization. Similar results are shown in Sivadasan (2006) and Topalova (2007) following trade liberalization, while Arnold et al. (2008) find positive productivity effects from India's policy reform in services.

2.1.2 Industrial De-licensing, Domestic Deregulation and Firm-Activity

Theoretical predictions about firm activity from macro models of entry liberalization and deregulation are ambiguous (see Blanchard and Giavazzi, 2003; Alesina et al. 2009).²⁰ Reducing entry barriers and reforms that imply a reduction in price mark-ups in excess of marginal cost are likely to lead

¹⁸ In the standard version of the model, there is firm selection into export markets but no feedback from exporting to firm productivity. See Bustos (2009) and Lileeva and Trefler (2007) for work in this direction.

¹⁹ Trade liberalization is widely believed to have pro-competitive effects that are ruled out by assumption in most models (constant elasticity of substitution preferences implying constant mark-ups). In contrast, in a world of variable markets, import competition could have differential effects on firms of different productivities through endogenous changes in mark-ups.

²⁰ Blanchard and Giavazzi (2003) develop a model of both labor market and product market regulation and their interconnection. Alesina et al. (2009) analyze a monopolistic competition model and show that that deregulation of product markets has a positive effect on capital accumulation if it generates a reduction in the mark-up of prices over marginal costs (for instance through a reduction in entry barriers) or if it lowers costs of adjusting the capital stock.

to an increase in the number of firms and investment. Regulatory reform can also influence the desired capital stock and number of firms via, for example, reduction in the red tape. On the other hand, for certain firms, removing constraints on rates of returns (especially removing ceilings restrictions) could lead to a reduction in investment.²¹

Most theoretical models, however, assume that firms are able to efficiently allocate resources within the firm and that factor markets are frictionless. Goldberg et al. (2009) argue that remnants of industrial regulation still affect the operation of Indian firms and may constrain their flexibility to adjust to new economic conditions.²² In India, there is evidence to suggest this, despite the extensive industrial deregulation in the early 1990s. Along with lengthy, cumbersome liquidation procedures, this factor often hinders firms from eliminating unprofitable product lines.²³ As noted by Panagariya (2008), “India operates in a world with virtually no exit doors.” India’s bankruptcy rate was, according to the World Bank (2005), of 4 per 10,000 firms, compared with 15 in Thailand and 350 in the United States. If the pattern in firm-entry and exit is consistent with these observations, we expect industrial de-licensing to be accompanied by dynamism in firm-entry but little incumbent firm-exit.

2.1.3 Privatization and Firm-Activity

Similarly, the effects of privatization stemming from agency problems and political mandates are ambiguous. For example, deregulation, through a reduction in mark-ups and in the availability of internal funds, may have a negative effect on investment if there is imperfect substitutability between internal and external sources of finance. This effect may be more relevant for firms severely affected by informational asymmetries and with limited collateral, such as small and young firms. On the other hand, if privatization reduces the influence of state-owned firms in the economy allowing new firms to enter, it can lead to an increase in investment.²⁴ While the theoretical predictions about the impact of privatization on firm-activity are ambiguous, we are particularly interested in examining the role of state-owned firms

²¹ In some network industries such as utilities and telecommunications, reforms entailing service liberalization and price rules for accessing networks can have conflicting influences on investment.

²² Some of their results also suggest that declines in tariffs are associated with somewhat bigger changes in the product scope of firms in industries, which are no longer subject to licenses at the onset of the 1991 reform as compared to regulated industries.

²³ For example, an all-India amendment to Industrial Disputes Act (1947) in 1982 required firms with more than 100 employees to seek government approval to dismiss workers (Kochhar et al., 2006).

²⁴ Alesina et al. (2009) find that regulatory reforms in the OECD have been associated with increases in investment. The authors find both entry liberalization and privatization to have had substantial effect on investment. There is also evidence to show that the marginal effect of deregulation on investment is greater when the policy reform is large and when changes occur, starting from already lower levels of regulation. In other words, small changes in a heavy regulated environment are not likely to produce any noteworthy effect.

in the Indian economy—the most influential incumbents before the reforms began. The next sub-section elaborates on this subject.

2.2 Reforms and the Role of Incumbent Firms

Somewhat missing from, or perhaps not emphasized in, many papers in this literature, are political economy considerations and in particular the role of incumbent-firm ownership. As emphasized by Stigler (1971), incumbent firms in profitable, concentrated sectors have a greater incentive to prevent entry.²⁵ Theory predicts that successful reforms will lead to a decline in industry concentration in liberalized industries and greater competition as signaled by greater variation in rates of return and coefficients of variation in firm-size.

The widespread privatizations of the 1980s and 1990s around the world generated a large empirical literature focused on understanding the effects of ownership on firm performance.²⁶ As reported by Chong and Lopez de Silanes (2004), between 1984 and 1996, the participation of state-owned enterprises in industrial countries declined from 8.5% of GDP to 5% (see Figure 1).²⁷ In middle-income countries it fell from 11% of GDP in 1980 to 5% in 1997 and from 15% to 3% in low-income economies. Employment dropped from 13% to 2% in middle income and 20% to 9% in low-income countries.²⁸ For India, our data suggest that between 2001 and 2005 state-owned firms accounted for 59%, 42%, and 50% of total assets, sales and profits.

Gupta (2005) studies the effects of partial privatization of state-owned enterprises in India and finds a positive impact on profitability, productivity, and investment. Her results also suggest that partial privatization does not cause the government to abandon the political objective of maintaining employment. This paper finds that the fractions of sales, assets and profits accounted for by state-owned firms have remained substantial in India for nearly two decades since liberalization and are substantially higher than in other countries, including the transition economies of Eastern Europe.

²⁵ Chari and Gupta (2008) find that reforms may be captured by powerful interests, particularly firms in profitable, concentrated industries and in industries with substantial state-owned firm presence. Given the deadweight loss associated with industry concentration, selective liberalization may inhibit economic growth.

²⁶ Megginson and Netter (2001), surveying the literature, find that most studies reveal a positive impact of privatization on profitability and efficiency of firms.

²⁷ Reviewing the evidence in Latin America, Chong and Lopez-de-Silanes (2004), note that most privatization led to higher profitability, output and productivity growth, fiscal benefits and quality improvements. The authors also highlight many instances of failure, which may be understood within the political framework (state participation in opaque processes, poor contract design, inadequate regulation or deregulation).

²⁸ These averages, however, mask huge variations. In Africa, state ownership remains higher than 15% of the GDP; in China the government still has control over important sectors of the economy.

3. Liberalization in India: The Reforms

Liberalization in India encompassed a series of reforms including foreign entry and trade liberalization, industrial de-licensing and de-reservation measures and services liberalization. In this section, we provide a broad overview of the reforms and refer the reader to studies that provide in-depth detail about specific reform measures.

Topalova (2004) provides a detailed overview of trade policy reform following the conditionalities imposed by the 1991 IMF Program. Benchmarks set forth under these conditions included a reduction in the level and dispersion of tariffs, a removal of quantitative restrictions on imported inputs and capital goods for export production, and elimination of public-sector monopoly on imports of almost all items.

It is important to note that the most significant initial trade reform was the removal of import licensing for capital and intermediate goods. However, tariff rates remained extremely high in the initial reform period. For example, the top tariff (while reduced) was brought down from 350 percent to 150 percent. Moreover, the 22 percent devaluation of the rupee further shielded the domestic industry from import competition, at least temporarily (Panagariya, 2008).

The government's export-import policy plan (1992–97), however, dramatically reduced the use of quantitative restrictions. The share of products subject to quantitative restrictions decreased from 87 percent in 1987-88 to 45 percent in 1994-95; all 26 import-licensing lists were eliminated and a “negative” list was established. Restrictions on exports were also relaxed, with the number of restricted items falling from 439 in 1990 to 210 in 1994 (Topalova, 2004).

Tariff reductions took place in 77 industrial categories and tariffs across a wide range of industries fell from a simple average of about 85% in 1990 to a value of approximately 12% in 2007 (Panagariya, 2008).²⁹ Topalova (2004) also notes that the standard deviation of tariffs dropped by approximately 63 percent during the period between 1987-2001 (Figure 2, Panel A).³⁰ At the industry level, although there was variation across industries, the sharpest drop in tariffs took place between 1991 and 1992.

We note that the trend towards de-licensing and de-reservation began with the industrial policy statements in 1985 that outlined many liberalization measures including not restricting business houses to Appendix 1 industries as long as they moved to industrially backward regions and raised the minimum

²⁹ The top tariff dropped from 50% in 1995-96 to 40% in 1997-98, 35% in 2000-01, 30% in 2002-03, 25% in 2003-04, 20% in 2004-05, 15% in 2005-06, 12.5% in 2006-07 and 10% in 2007-08. Some tariff peaks being outside the top rate, the simple average of tariffs on industrial goods in 2007 was approximately 12%. Custom duty collection in 2005-06 as a proportion of merchandise imports was just 4.9 % (Panagariya, 2008).

³⁰ Data for Figure 2 were generously provided by Petia Topalova.

asset limit defining business houses. The pace of these policy trends accelerated with the New Industrial Policy outlined in the Industrial Policy Resolution of 1991.

Compulsory industrial licensing was abolished for all except 18 industries. Large companies no longer needed MRTP approval for capacity expansions. The number of industries reserved for the public sector in Schedule A (IPR1951) was cut from 17 to 8,³¹ Schedule B, which listed industries open to the private sector but with increasing involvement from the state particularly for new establishments, was abolished altogether.³² Importantly, limits on foreign equity holdings were raised from 40 to 51% (for industries listed in Annexure III of the Statement of Industrial Policy in 1991) under the “automatic approval route.” The *Industrial Policy Resolution of 1991* (Office of the Economic Advisor, 2001) provides information about the list of manufacturing industries in which the state liberalized foreign entry and also a list of industries where domestic entry restrictions continued to be in effect.

Services reforms while rapid in the 1990s varied across sectors. Appendix A in Arnold, Javorcik, Lipscombe and Mattoo (2008) provides an excellent and detailed survey of the services liberalization reforms by sector between 1991 and 2005. Their paper carefully examines major policy changes enacted between 1991 and 2003. The first significant changes in financial services (banking and insurance), telecommunications and transport are recorded as early as the 1993-94 fiscal year. The authors highlight some of the major policy changes they recorded for four services sectors, and then describe a strategy for quantifying this information into a services reform index. In order to make the services policy information amenable to quantitative analysis, we translated the policy changes into a sector-specific reform index, taking values from 0 to 5. We reproduce Figure 1 from their paper that provides a graphic illustration of the variation contained in the services reform index across four services sectors (see Figure 3).³³

Following the description in Section 2, we would expect a transformation of India’s micro-economic structure following this broad and wide-ranging reform process: new firms entering and expanding production, increased competition from new entry as well as imports, and exit by unproductive incumbents that are unable to adapt to the changing economic environment. Most theoretical work on the

³¹ According to the Industrial Policy Resolution (1948), Schedule A comprised among others (i) industries exclusively reserved for the State (atomic energy, arms and ammunition and railways), and (ii) basic industries where the State would have the exclusive right to undertake new investments (iron and steel, mineral oils, coal, shipbuilding, aircraft production and telecommunications equipment). Other categories included eighteen industries of national importance regulated and licensed in cooperation with state governments and industries open to private-sector participation. The Industrial Policy Resolution (1956) included the nine industries in categories (i) and (ii) of IPR 1948 and added eight additional industries including mining sectors, air transportation and some heavy industries.

³² These industries included minerals, aluminum and other non-ferrous metals not listed in schedule A, machine tools, basic intermediate products required by the chemicals industries, antibiotics and other essential drugs, synthetic rubber, fertilizers, and road and sea transport.

³³ We are grateful to the authors for permission to use their figures.

effects of liberalization analyzes static effects. India experienced high growth during our period of analysis, in particular, towards the end, suggesting additional effects on entry, exit and expansion in addition to those implied by the standard models (confounding further the overall effects at the macro level). Alternatively, as mentioned earlier, the reform process has been slow, and piecemeal in nature. Moreover, while we might expect to see dynamism in firm-entry, particularly by private and foreign firms following liberalization, lingering restrictions may imply little incumbent firm-exit.

4. The Prowess Data

We use firm-level data from the Prowess database. The sample period is from the year of inception of dataset, 1988 to 2005.³⁴ The data are collected by the Centre for Monitoring the Indian Economy (CMIE) from company balance-sheets and income statements and covers both publicly-listed and unlisted firms from a wide cross-section of manufacturing, services, utilities, and financial industries. About one-third of the firms in Prowess are publicly listed firms. The companies covered account for more than 70% of industrial output, 75% of corporate taxes, and more than 95% of excise taxes collected by the Government of India (Centre for Monitoring the Indian Economy).

Prowess covers firms in the organized sector, which refers to registered companies that submit financial statements. According to the Government, “The organized sector comprises enterprises for which the statistics are available from the budget documents or reports etc. On the other hand the unorganized sector refers to those enterprises whose activities or collection of data is not regulated under any legal provision or do not maintain any regular accounts” (Informal Sector in India: Approaches for Social Security, Government of India, page 2, 2000). Indian firms are required by the 1956 Companies Act to disclose information on capacities, production and sales in their annual reports. All listed companies are included in the database regardless of whether financials are available or not.³⁵

The Indian National Industrial Classification (NIC) (1998) system is used to classify firms in the Prowess dataset into industries. The data include firms from a wide range of industries including mining, basic manufacturing, financial and real estate services, and energy distribution.

The main advantage of firm-level data is that detailed balance sheet and ownership information permit an investigation of whether the presence of certain types of incumbent firms in an industry affects the evolution of industry and firm characteristics, as also the responses to policy changes such as

³⁴ The Prowess database has now been used in several studies including Bertrand et al. (2002), Khanna and Palepu (1999), Fisman and Khanna (2004), Khanna and Palepu (2005), Topalova (2007), Dinc and Gupta (2007), Chari and Gupta (2007), and Goldberg et al. (2008, 2009).

³⁵ Unlisted companies are not required to disclose its financials. CMIE asks their permission, but if they refuse, it cannot include these companies in Prowess.

liberalization. In contrast, industry-level databases usually do not provide information about sales, assets, profits and employment under different ownership categories.³⁶ The firms in the data belong to three main ownership categories: state-owned firms, private firms and foreign firms. Private firms include family-owned business groups and unaffiliated private firms. Appendix Table 1 provides a description of variables used in the data analysis.

One concern with the data may be related to new entrants versus improvements in the data coverage by CMIE. However, for all firms that Prowess decides to cover, regardless of when the decision is made, financial data from 1989 onwards, wherever available, is added to the database. That is, even if coverage for a firm begins only in 1995, CMIE goes back and gets data from at least 1989, if not earlier. Hence, for the sample that we consider, the entry numbers are not distorted by changing coverage (except, of course, from firms that are actually incorporated in that period). Nevertheless, we are cautious when interpreting the results.

A point regarding data coverage of foreign firms is worth highlighting. Firms are classified as domestic or foreign depending on the incorporation location. For example, in the case of Jet Airways, the holding company is incorporated overseas and therefore classified as a foreign firm. Also, as in the case of unlisted domestic firms, data on unlisted foreign firms is available only if the firm chooses to disclose its financial information. CMIE requests unlisted foreign firms for permission, but if they refuse (as for example, McDonald's and Coca Cola have done) then the firms are not included in Prowess.

Chari and Gupta (2007) compare the Prowess data with the Annual Survey of Industries (ASI) conducted by the Government of India. The ASI is a survey collected on a sampling basis of factories employing 100 or more workers.³⁷ Although the overlap in the list of industries covered by the two datasets is not perfect, the ASI data nevertheless provide a useful cross-industry benchmark for the coverage in Prowess. For instance, the ASI data focus exclusively on the manufacturing sector, whereas Prowess covers several additional service sectors including defense, restaurants, hotels, and IT services. The authors find that in 41 of the 51 three-digit industries covered by both databases, total industry sales in Prowess is an average of 77% of the value of total sales for the same industry in the ASI.

Goldberg et al. (2009) argue that the Prowess dataset is not a manufacturing census, and therefore may not be ideal for studying firm-entry and exit, given that it includes only larger firms for which entry and exit are not important margins of adjustment. However, it is pertinent to note that unlike the Annual Survey of Industries (ASI) which is a survey of manufacturing, the Prowess data is a panel of firms, rather

³⁶ Since firms are not required to report employment in their annual reports, we observe employment data for only a more restricted sample of firms. Financial services are the only industry that is mandated by law to disclose employment information. Since the sample of firms that report employment is small, we do not focus on these numbers.

³⁷ The sampling design is outlined in detail in items #9-#11 at http://www.mospi.nic.in/stat_act_t3.htm.

than a repeated cross-section. Prowess is therefore particularly well suited to examining how firm-characteristics including entry and exit evolve over time and may respond to policy changes. (For instance, Goldberg et al. (2009) use the Prowess dataset to examine how firms adjust their product-mix over time). Firms that no longer report sales or assets are assumed to have exited. We also classify firms that do not report data because of mergers and acquisitions as firms that exit the data due to consolidation.

Finally, the predominant emphasis of the extant literature using firm-level data on India has been on the manufacturing sector. An important advantage of Prowess is its coverage of firms in the services sector widely credited for India's growth miracle. The next section documents stylized facts about the evolution of India's industrial composition and firm activity against the backdrop of these broad-sweeping reforms.

5. The Evidence

We study five sub-periods: 1988-1990; 1991-1994; 1994-1998; 1999-2002 and 2003-2005. These periods broadly match the different waves of liberalization. Our objective is to provide the reader with an overview of the evolution of India's industrial composition in the last twenty years. We present deflated data using the GDP deflator from World Bank, World Development Indicators. For expositional purposes, the tables collapse the sectors in ten: agricultural, mining & extraction; food, textile and paper manufacturing; chemical and plastics manufacturing; metals and industrial manufacturing; utilities, construction and retail; transport; hospitality, tourism, media, health and other services; financial services and real estate; business, computer and communication services and miscellaneous diversified. Appendix Table 2 presents detailed information on the industries included in each sector and the number of firms by sector.

Tables 1 to 5 present detailed information on the number of firms, firm size (assets, sale) and profitability (profit before interest depreciation and taxes and return on assets) for all firms in our sample by sector as well as by category of firm: state-owned enterprises, foreign firms, private firms incorporated before 1985 (also referred to as traditional firms) and private firms incorporated after 1985 (also referred to as new private firms). Table 6 presents information on the dispersion of returns. Table 7 describes the composition of number of firms, firm size and profitability as a percentage of the total (by ownership group and sector). Table 8 presents additional information by year of incorporation, and Tables 9 and 10 describe the evolution of firm size and concentration.

5.1 Reforms and Dynamism?

The columns in Table 1 present data on the average number of firms by type of ownership and sector. The table shows information for the full sample across all sectors by type of ownership, followed by information for each of the different sectors by type of ownership and finally, data consolidated by sector.

Consistent with the rapid growth observed in India after the mid-eighties (as documented in Table A) overall firm activity as proxied by the number of firms grew substantially relative to the beginning of the sample period. There is, however, heterogeneity in ownership type. The average number of state-owned firms increased from 645 in the 1988-1990 to 693 in 1995-1998 ending in 617 by 2003-2005. The number of firms incorporated before 1985 decreased in this period from 7,551 in 1988-1990 to 5,685 in 2003-2005. These numbers are in contrast to the growth rates in the average number of new private firms: up from 3,031 in 1988-1990 to close to 8,864 at the end of the period. The number of foreign firms increased from an average of 533 in 1988-1990 to 748 by 2003-2005.

While one cannot infer causality from our results, following the different wave of reforms in the mid-1980s and early 1990s, the increasing number not just of private but also of foreign firms suggests that the liberalization measures enacted to allow domestic entry through de-licensing and de-reservation, combined with the liberalization of foreign direct investment, promoted greater dynamism in new entry by firms other than the incumbents of the pre-reform period (state-owned and traditional private firms incorporated before 1985). Indeed, the doubling of the average number of foreign firms in this period is suggestive of substantial foreign entry albeit from very low levels in the pre-reform period.

These patterns are broadly mimicked within sectors. Agriculture, for example, is characterized by a relatively stable average number of state-owned firms and increasing activity by private and foreign firms (again the former from a relatively low base). The average number of traditional private firms in this sector decreased from 145 in 1988-1990 to 112 by 2003-2005.

In food, textiles and paper manufacturing, chemicals and plastic manufacturing, and metals and industrial manufacturing, the average number of state-owned firms decreased from 83, 56, and 97 respectively in 1988-1990 to a corresponding 56, 46, and 73 in 2003-2005. The number of traditional private firms shows somewhat similar patterns: the average numbers went from 1,328, 1,150 and 1,450 respectively in 1988-1990 to a corresponding 907, 816, and 995 by 2003-2005. In contrast, the number of private and foreign firms has increased substantially between 1988 and 2005.

Similarly, we observe high growth in the number of private and foreign firms in sectors such as utilities, construction and retail; hospitality, tourism and media; financial services and real estate; and business, computer and computer communications and others. In these same sectors, there was an

increase in the number of state-owned firms while there were slight reductions in the number of traditional private firms.

Business, computer and communication services and financial service and real state by far show the highest growth rates for all type of firms, but again, private and foreign firms show substantial activity in terms of number of firms. Panagariya (2008) hails the success story in the telecommunication sector as the triumph of reforms. As the last panel in Table 1 shows, there was an overwhelming increase in the number of firms in this sector.³⁸

Overall, Table 1 presents a picture of a dynamic economy driven by private and foreign firms and the transformation of the Indian economy. In fact the data suggests that 1988-1990 was already a period of great activity in terms of the number of firms. We examined within-period growth in the number of firms for this period and found it to be substantial ranging from 35% for foreign firms and 115% for new private firms. As mentioned, while our data precludes comparisons with the pre-1985 period, the evidence is consistent with arguments in Panagariya (2008, pp. 18-19) that the reforms of the 1980s opened the door to wider entry by new firms. Consistent with previous evidence, the data also suggest that the regime shift in India's growth path began in the mid-1980s.

We note that there was acceleration in entry in the period following 1991 that continued through the rest of the decade. Further, our findings corroborate observation of lingering exit restrictions. While the data presents clear evidence on dynamism in firm-entry particularly by private and foreign firms, we observe little incumbent firm-exit (notwithstanding methodological issues in the collection of the data).

Table 2 presents information on average assets of ownership type and sector (in constant rupees crore). Average assets have also grown in the last two decades particularly for new private firms and firms in the foreign sector, although the initial values of assets under foreign ownership and private firms incorporated after 1985 were very low (the latter by construction). The table shows high accumulation of assets in private and foreign firms in all sectors of the economy but particularly in agriculture, mining and extraction, food, textile and paper manufacturing, transports, utilities, construction and retail, business and IT services, financial services, and other services (hospitality, tourism, media, health and others). Foreign firms also show increased participation in recent periods and in particular in sectors such as transportation, and media, health and other services. While one cannot infer causality, greater foreign firm access did not seem to come at the expense of the overall significance of private domestic firms (see Alfaro and Charlton (2007) for similar results for a broad sample of countries).

The lower panel in Table 2 shows asset accumulation across sectors suggesting an increasing role in service-related activities. The growth of assets is far more dramatic in financial services and real estate,

³⁸ See Appendix Table 2 for activities included in each classification.

business, computer and communication services, utilities, construction and retail, transport, construction and media.

Table 3 presents similar detailed information on sales (in constant rupees crore), where much the same pattern emerges. Although there is substantial growth across all forms of ownerships and sectors, the data suggest higher activity in terms of sales growth by foreign and new private firms and in growth in the services sectors. Sales by new private firms, growth was particularly strong in transport, hospitality, tourism media and health, while foreign firm growth was high in transport, business, computer and communication services. As in previous patterns, there was noticeably high growth in sales of new private firms in agriculture in the period 1991-1994 versus 1988-1990.

Table 4 shows profits (profits before depreciation, interest payments and rents of firms in constant terms) by ownership and sector. New private firms stand out in terms of the growth rate in their average profits. However, all type of firms, state-owned, traditional and new private firms and foreign firms also show high rates of growth in the average level of their profits. For foreign firms, financial services and business and computer-related activities witnessed the highest rates of growth in average profits. It is also worth noting that across economic activities, sectors in the services (such as utilities, construction and retail, hospitality, tourism, media and health and financial services) dominated those activities in the manufacturing sector (such as food, textile and paper manufacturing and chemicals and plastics) for profit growth. It is also worth highlighting the high growth in profits in agriculture and mining by traditional private firms in the period 1991-1994 versus 1988-1990.

Table 5 shows a more subtle picture emerging, which reflects the return on assets. In the early period of 1988-1990, for the full sample, traditional private businesses display the highest average rate of return (13.53%) followed by new private firms (12.93%) and then foreign firms (12.36%). State-owned firms come last with an average rate of return of 8.90% during this period. After 1991 the picture changes. Traditional private firms and new private firms experience a decline in the return of assets reaching 10.66% and 8.11%, respectively, in 1999-2002 to increase to 12.39% and 8.54%, respectively, during 2003-2005. State-owned firms in contrast experienced an increase in the return on assets with a figure of 10.61% in 2003-2005 from 8.90% in 1988-1990.³⁹ Foreign firms also experience an increase in the return on assets with a 14.94% return for the 2003-2005 period compared to 12.36% in 1988-1990. It is interesting to note that the dispersion in rates of return remained almost the same from 1988-1990 (at 4.63%) until 1999-2002 (at 4.38%) to increase to 6.39% in 2003-2005 across ownership group. The

³⁹ Bai et al. (2006) estimate the aggregate marginal product of capital in China to be around 20%, down from 25% in the pre-reform period.

coefficient of variation in returns across ownership increased from 0.17 in 1988-1990 to 0.23 in 2003-2005.

For state-owned firms, the highest rate of return was in agriculture, mining and extraction, (21.27%) followed by business, computer, and communication services (15.85%); metals and industrial manufacturing (15.74%); and food, textile and paper management (15.63%) in 2003-2005. The sectors with the highest rates of return for traditional private firms were business, computer, and communication services (23.65%) and agriculture, mining and extraction (22.91%). For new private firms, the highest rate of return was agriculture, mining and extraction (12.38%), transport (11.09%), and business, computer, and communication services (11.09%). It is important to highlight that in agriculture, mining and extraction, food, textile, and paper manufacturing, chemicals and plastics manufacturing, transport, hospitality, tourism, media, health, and other service and miscellaneous diversified activities, foreign firms earned the highest rates of return across ownership groups. For the full sample, the highest rate of return was in agriculture, mining and extraction (17.31%) and the lowest in hospitality, tourism, media and health (8.15%) in 1988-1990. In 2003-2005, the highest rate of return was in transport (13.54%) and the lowest in financial services (6.73%).

Table 6 presents data on the sectoral variance of return on assets measured by dispersion in the top panel and by the coefficient of variation⁴⁰ in the second one. As seen in Table 6, in 1988-1990, the dispersion in returns across ownership groups within a sector was the highest in transport (20.49%) and the lowest in metals and industrial manufacturing (5.97%) and financial services (7.22%). In the period 2003-2005, the dispersion in returns ranged from 22.76% in miscellaneous to 1.55% in utilities, construction and retail. Interestingly, the dispersion in returns across sectors fell from 11.62% in the early period to 9.41% in the most recent period.

The coefficient of variation within sectors across ownership groups was 0.19 in food, textile and paper manufacturing and 0.77 in transport in 1988-1990 and ranged from 0.07 in utilities, construction and retail to 0.80 in miscellaneous diversified production in 2003-2005. The coefficient of variation in returns across sectors went from 0.24 in 1988-1990 to 0.28 in 2003-2005.

In sum the panels in Table 5 and 6, tell an analogous story. The rate of return is remarkably stable for the full sample across time with an average return on assets of 11.93% in 1988-1990 to 11.62% in 2003-2005. While there is cross-sectional variation in rates of return across ownership groups and sectors, there is relatively little dispersion in the rates of return as seen in the tight range of returns and the low coefficient of variation within sectors by ownership groups and across sectors (see Figure 4). The patterns

⁴⁰ The coefficient of variation is a normalized measure of the dispersion of a probability distribution. It is defined as the ratio of the standard deviation to the mean. For examples, distributions with coefficient of variation less than one are considered low variance and higher than one high variance.

in the return on assets are striking when compared to the large variations we see in terms of new firm-entry by foreign and private firms and in the growth of their assets, sales and profits in comparison to the lower rates of entry by state-owned and business-group affiliated firms.

A growing literature argues that the differential effects of policies and institutions on the investment climate broadly defined might significantly influence the allocation of resources across establishments. The working hypothesis in this literature is that not only the level of factor accumulation, but also how these factors are allocated across heterogeneous production units, matters in trying to understand income differences (see Hsieh and Klenow, 2009; Restruccia and Rogerson, 2008; Alfaro, Charlton and Kanczuk 2008). That is, the great divide between rich and poor countries may not just be explained by lack of capital and skilled labor but also by the consequence of the misallocation or misuse of available resources.

For India, Hsieh and Klenow (2007) use plant-level information from the Indian manufacturing census data to measure dispersion in the marginal products of capital and labor within 4-digit manufacturing sectors. When capital and labor are hypothetically reallocated to equalize marginal products to the extent observed in the United States, the authors find efficiency gains of 50%-60% in India.⁴¹ As noted by Klenow (2008), the importance of allocative efficiency has been motivated by the fact that the growth took off in India in the wake of a series of policy reforms. In this paper, we show that the coefficient of variation in the rate of return on assets is relatively low across both industries and owners. A further point to observe is that state-owned firms earn substantial profits. It is not clear whether these returns stem from monopoly power in concentrated industries or because they are efficient. If it is the former, further privatization may serve to raise returns even higher, notwithstanding the caveat that private monopolies do not replace state-owned monopolies.

5.2 Or, Is It Continuing Incumbent Control?

Table 7 presents information about the shares of the number of firms, assets, sales and profits by ownership groups and sectors. Although the table carries substantial information, some clear, interesting but conflicting, patterns emerge. Overall, what appears is not a story of dramatic transformation in India's micro-economic structure following liberalization. Rather, it is one of an economy still dominated by the incumbents (state-owned firms and traditional private firms) and the sectors of the pre-reform period (see Figure 5). The evidence corroborates the arguments in Panagariya (2008).⁴²

⁴¹ Hsieh and Klenow (2009) use manufacturing data from India's Annual Survey of Industries (ASI) from 1987-1988 through 1994-1995.

⁴² The evidence is consistent with a slow and gradual reform process.

Despite low shares in the number of firms, India's formal sector continues to be dominated by state-owned enterprises and to a lesser extent by traditional private firms in terms of shares of assets, sales and profits. Between 1988-1990, on average, new private and foreign firms accounted for 26% and 5% of the total number of firms, respectively, while state-owned firms and traditional private firms accounted for 5% and 64% of the total number of firms, respectively. Between 2003-2005, on average, the number of new private firms accounted for 56% of all firms, while the number of traditional private firms was 36% of the total number of firms. The share of the number of state-owned firms and foreign firms remained virtually unchanged at 4% and 5% respectively. The 60-40 split in the number of firms between the shares of private and foreign firms and the shares of state-owned and traditional private firms is replicated across sectors. The exceptions are, business, computer and communication, where the split is 80-20, which reflects the even higher number of new private firms.

In striking contrast, state-owned and traditional private firms overshadow the shares of assets, sales and profits. Between 1988 and 1990, state-owned and traditional firms accounted for 94%, 87% and 91% of total assets, sales and profits. Between 2003 and 2005, these fractions stood at 77%, 73% and 78%, respectively. While the rising importance of foreign and private firm activity is evident from the data, it appears that the incumbents from the pre-reform period control nearly three-quarters of the economy in broad terms: state-owned firms and traditional private firms. It is worth pointing out, however, that although the shares of assets, sales and profits appear largely under the control of incumbent firms, given that the number of private and foreign firms has been increasing across sectors, competition at the margins is probably intensifying alongside of competition from imports in sectors that were liberalized to trade.

The importance of the state-owned firms has remained extraordinarily high suggesting perhaps insufficient reform. Privatization efforts were abandoned after a short spell in the early 2000s and sectors such as manufacturing and financial services remain largely under state control. For example, average total assets of state-owned firms represented close to 70% of total assets in 1988-1990, and stood at over 60% by 2005. Given virtually no privatization, however, we note that while this is not an inconsequential shift, the extent of state control makes India an outlier in the world economy (with the exception of China, of course).⁴³ Average share of total assets owned by traditional private firms remained relatively constant at 25% between 1988 and 1998 while falling to 17% by 2005. New private firms' average share of assets in contrast rose from of 1% in 1988-1990 reaching 15% at the end of the period. The share of assets under foreign firms has remained relatively constant throughout the period moving from 5% in 1988-1990 to a mere 7% in 2003-2005.

⁴³ See Chong and Lopez-de-Silanes (2004).

Average sales by state-owned firms remained at close to 40% of total sales throughout the sample period, while the average share of traditional firms dipped from 45% to 31% and that of new private firms rose from 2% to 17%. Foreign firms represent close to 10% of total sales on average remaining relatively stable throughout the period. Profit shares also remained relatively stable throughout the period for state-owned firms, representing close to 55%, and for foreign firms at 9%. Traditional private firms and new private firms marked a shift from 36% and 1% respectively at the beginning of the sample period to 22% and 13% respectively in 2003-2005.

Although there is considerable variation in assets, sales and profit shares across sectors, an interesting pattern emerges. Sectors dominated by state-owned firms before liberalization (with fractions higher than 50% to 60%) remain the dominant ownership groups following liberalization. For example, in agriculture, state-owned firms represented close to 95% of all assets, sales and profits in the period 1988-1990. By 2003-2005, state-owned firms still represented close to 90% of assets, sales and profits. Similarly, in utilities, construction and retail and transport state-owned firms accounted for more than 70% and 50% of assets respectively in the period 1988-1990 and in 2003-2005, with similar shares for sales and profits. Traditional private firms led chemicals and plastic manufacturing, metals and industrial manufacturing, and activities in the miscellaneous diversified groups.

Interestingly, while in all sectors the share of new private and foreign firms has remained low, they have gained importance in recent years. In particular, an important exception to state and traditional private-firm dominance is seen in business and business, computer, and communication where new private firms accounted for close to 40% of asset shares in 2003-2005. Shares of total sales and profits display a similar pattern. These activities therefore represent not only growth in terms of numbers of firms but also in terms of importance in assets, sales and profit shares. The firm-level evidence in these industries mirrors the services growth in the aggregate data, especially after 2000.

Activities in manufacturing such as food and textile and paper manufacturing, chemical and plastics manufacturing and metals and industrial manufacturing still dominate sales. While these sectors still represent a high share of assets, it is the financial service and real estate activities that dominate assets. In food and textile and paper manufacturing, and metals and industrial manufacturing, state-owned firms account for 38% and 24% of assets; 58% and 16% of sales and 43% and 25% of profits in the current period down from 50% and 51% of assets; 60% and 33% of sales and 47% and 38% of profits. Chemicals and plastics manufacturing, however, remains dominated by traditional private firms which still account for more than 50% of assets, sales and profits. The combined role of private and foreign firms in assets, sales and even profits peaked at close to 40% in recent years in chemicals and metals and close to 20% in food and textile. Overall, for activities in the manufacturing sector, the picture remains one of a sector dominated by incumbents (state-owned firms and traditional private firms).

In the financial services sector, state-owned and traditional private firms accounted for 97% of total assets, sales and profits in 1988-1990. These shares stood at 80%, 83% and 81%, respectively, in 2001-2005.

Table 8 presents information by year of incorporation (between 1947-1977, 1977-1990 and 1991-2005) for number of firms, firm size, assets, sales, employment, profitability, and rate of return and their evolution in the different periods of study.⁴⁴ The oldest firm in the sample (Howrah Mills Company Ltd.) was incorporated in 1825, and the sample begins with over 1,200 firms that were incorporated before independence. From this group 91 firms exit the sample through mergers. Many of these older firms (pre-independence), however, remain in operation following the reforms.⁴⁵ An industrial shake-out perhaps characteristic of a creative destructive wave following widespread reform is not manifest in the data.

Overall the evidence presented in Sections 4.1 and 4.2, the low number of state-owned and business group affiliated firms combined with their dominant shares of assets, sales and profits, is suggestive of high industry concentration by incumbents.

Using data on product lines, Goldberg et al. (2009) find the contribution of the net product margin to total output growth, following liberalization in India, to be driven almost exclusively by product additions, and not by discontinuation of product lines that have become obsolete.⁴⁶ The authors argue that product churning or “creative destruction” along the product dimension did not happen in India in the 1990s, despite the fact that firms were undergoing major trade and other structural reforms during this period.⁴⁷ In relation to these findings, our results suggest that creative destruction in firm-entry and exit, where new entrants replace incumbent firms, does not appear to characterize firm-activity in the Indian context following liberalization. Consistent with the addition of product lines in Goldberg et al. (2009), there was substantial firm-entry across all sectors and in particular in the services sectors. However, it

⁴⁴ A point about firm-exit is worth noting. The dataset contains a code for firms that exited the data via mergers and acquisitions. However, the data do not contain a flag for firms shutting down versus discontinued coverage. Therefore, when we no longer observe data for a firm, we assume firm-exit. But again, this may also reflect discontinued coverage by Prowess or the failure of unlisted firms to provide data about their operations. Results should, hence, be interpreted with caution.

⁴⁵ The data also suggest that the profitability of older firms (incorporated before 1985) surpasses that of newer firms (incorporated after 1985). This finding may in part reflect survivorship bias (surviving older firms) and the fact that young firms may have lower returns in their early years.

⁴⁶ Recent theoretical models that focus on the relationship between trade costs and product-mix predict that firms adjust to a decline in trade costs through product dropping, see Bernard, Redding and Schott (2006, 2009).

⁴⁷ Goldberg et al. (2008, 2009) examine whether Indian firms change their extensive product margin in response to India’s large-scale tariff liberalization during the 1990s. Their analysis suggests that despite the regulatory constraints, changes in firms’ product-mix made a noticeable contribution to growth; on net, they account for approximately 25% of the increase in Indian manufacturing output during our sample period. However, in contrast to the U.S., only 30% of Indian firms show a change in their product-mix over a 5-year period. Firms in India infrequently drop a product or simultaneously add and drop a product. See Bernard, Redding and Schott (2006, 2009) for evidence in U.S.

does not appear that firm-entry was also accompanied by a decline in the importance of incumbent firms. This may simply be because the incumbent firms restructured and became competitive. In industries such as airlines, banking, and telecommunications, incumbent firms have restructured with a significant rise in their productivity. Alternatively, incumbent firms, especially state-owned firms, may continue to operate because they remain heavily subsidized by the state.

The next section examines the evolution of industry concentration and firm size across industries and ownership shares and the impact of various liberalization measures enacted in 1991.

5.3 Maintaining Control: Market Share and Concentration

In order to understand the efficient allocation of resources, we look at market dynamics with regard to promotion of competition. We measure the degree of competition (consolidation) as a measure of competitive efficiency to examine how industrial concentration has evolved over time.

Table 9 includes information on industry concentration (the Herfindahl index⁴⁸) and dispersion measures (coefficient of variation calculated by assets and sales). Underlying average market share values are calculated for a given firm across the years in a sub-period and then the Herfindahl index is calculated by industry for a given sub-period. It may be noted that the Prowess database provides four-and-five-digit industry classifications for most firms. However, because the liberalization policies were enacted at the three-digit level, industry concentration accordingly is computed at the three-digit level. We present data for the full sample first and then by the different forms of ownership.

For the overall economy, Table 9 shows a reduction in market concentration for the average firm throughout the sample period. The Herfindahl indices suggest an increased degree of competition among firms in India. This finding is consistent with the earlier evidence on increased firm-activity and overall higher dynamism in the economy. However, despite the evidence about increased levels of competition, even for 2001-2005, the concentration measures remain high. Chari and Gupta (2008) compare the industrial structure in India with that of the United States (taken as a benchmark of a country with fewer regulations and more developed financial markets). They find that in 1990, a year before the reforms, the average Herfindahl index in India was significantly higher (40%) than in the United States (24%) for the same three-digit SIC industries, while concentration in Industries that remained protected was significantly higher than their U.S. counterparts (54% versus 22%).

⁴⁸ The Herfindahl index is an indicator of the degree of competition among firms in an industry. It is defined as the square of the market shares of each firm in an industry. The value of the Herfindahl index can range from zero in perfectly competitive industries to one in single-producer monopolies). All data are first expressed in constant rupees crore.

The coefficient of variation (for both sales and assets) indicates increased dispersion. Overall, consistent with theory, what emerges is a picture of the average firm in India growing bigger, in terms of assets, sales and profits, perhaps with some gaining more than others as heterogeneity increased substantially in the period. The finding also suggests a decline in the traditional dominance of small firms in India.

In terms of the different ownership groups, for the average state-owned firm, dispersion has also increased. Overall, the average state-owned firm has grown bigger, more profitable and somewhat more dissimilar. This may largely reflect greater involvement of the state in the commanding heights of the industry and its monopoly in certain sectors. The share here refers to the fraction of assets (sales) owned by state-owned firms relative to the total assets (sales) in a particular industry. For traditional private firms, dispersion also increased during the period. In sum, the average traditional private firm has become more profitable, bigger, and more disperse (particularly during the last sub-periods of the data). For new private firms, there is a substantial increase in heterogeneity in this group, which characterize a great many firms. As for foreign firms, they too show increased dispersion.

The previous discussion portrays the evolution of firms in India from 1988-2005, a period characterized by substantial reforms. These reforms took many forms (liberalization of FDI, trade, domestic markets, etc) at different times as different sectors were liberalized each at a difference pace. Although a formal causal analysis of the effect of these policies is beyond the scope of this paper, Tables 10a-c describe how firms evolved before and after in industries that enacted specific reforms: liberalization of foreign direct investment, trade liberalization and domestic market deregulation.⁴⁹

Table 10a shows measures of industry concentration, and dispersion averaged across sectors that were for the period before FDI liberalization in the first column and after FDI liberalization in the second one. The FDI reforms in 1991 reduced barriers to foreign entry in a subset of industries. Specifically, according to the Industrial Policy Resolution of 1991, automatic approval was granted for foreign direct investment of up to 51% in 46 of 96 three-digit industrial categories (Office of the Economic Advisor, 2001). In the remaining 50 industries, the state continued to require that foreign investors obtain approval for entry. The top panel of the table shows the results for the whole sample and the lower ones by ownership group. The sample is restricted to industries that deregulated foreign investment, to two years before (1989-1990) and to five years after (1991-1995) the policy was implemented in 1991.

For the average firm, industry concentration declined significantly following the policy change from 0.26 to 0.20 in liberalized industries. Dispersion (both in terms of assets and sales) also increased

⁴⁹ Variations in the number of industries in Tables 10a before and after liberalization reflect entry or exit by different owner categories into industries that were liberalized. The number of industries in the results for the full sample gives the maximum number of liberalized industries.

following the reforms. Industries that were liberalized had lower concentration ratios before liberalization than non-liberalized economies. Concentration falls below the Herfindahl index for the full sample after liberalization suggesting that non-liberalizing industries had and continue to have substantially higher levels of concentration. These results are consistent with findings in Chari and Gupta (2008).

Closer examination reveals substantial heterogeneity across groups. The data shows a significant increase in dispersion across state-owned firms. In the case of traditional private firms as well, dispersion seems to have increased considerably. FDI liberalization (of up to 51% ownership stake) in many instances necessitated a local partner. As such, many local business groups stood to gain by the liberalization process (as they were the obvious partner to take in many instances). Similarly, the results show that for new private firms and foreign firms, increase in dispersion was substantial.

Table 10b presents similar results for trade liberalization. First, it is important to note that trade liberalization in 1991 was inversely related to industry concentration before 1991. Second, following trade liberalization, the industry concentration of the average firm in the economy declined significantly five years following the policy change. Third, dispersion also increased following trade liberalization. Looking across ownership types, we find substantial heterogeneity.

Finally, 10c shows similar summary statistics for pre- and post-domestic market deregulation. The trends also display substantial heterogeneity across groups. One interesting pattern is that market concentration seems to have diminished for the liberalizing industries more dramatically, following domestic market regulation, than FDI deregulation and in particular trade liberalization (perhaps not very surprising, given the extent of regulation and lingering restrictions).

Overall, preliminary findings suggest that industry concentration and average market shares decline in industries that experienced either de-licensing or FDI and/or trade liberalization. The coefficient of variation in average firm sales and assets increased suggesting that there is greater dispersion in firm size within liberalized industries. Our future endeavor will be to disentangle the precise mechanisms through which specific reforms affect firm activity in liberalized industries.

6. Conclusion

Between 1986 and 2005, Indian growth put to rest the concern that there was something about the ‘nature of India’ that made rapid growth difficult. Following broad-ranging reforms in the mid-1980s and early 1990s, the state deregulated entry, both domestic and foreign, in many industries and also hugely reduced barriers to trade. While liberalizations are believed to transform economies through competition and the removal of distortions, the effects of liberalization may not be uniform. Some industries may be better equipped for change while others are not. Within industries, new entrants may gain market share, while incumbents go bankrupt. Restrictions may linger in some sectors, and for some firms.

In this paper we analyze the evolution of India's industrial composition by focusing on the micro-foundations of its productive structure: we examine the evolution of India's industrial structure at the firm level following reforms. In addition to changes in the industrial composition, we examine whether entry took place and if so, whether at the expense of traditional incumbents such as state-owned and traditional private firms. Finally, we examine the evolution of firm size, market share and industry concentration over time and in industries that were liberalized to either domestic or foreign entry or trade.

Using firm-level data, we document dynamism and change in the productive structure following the implementation of economic reforms. Substantial new entry by foreign and private firms went along with high growth in their assets, sales and profits. In recent years, for example, some new and important private players have emerged in sectors such as information technology services (IT), pharmaceuticals and telecom. However, despite the substantial increase in the number of private and foreign firms, the overall pattern that emerges after close to two decades of reforms is one of continued incumbent dominance in terms of assets, sales and profits: state-owned firms and traditional private firms. In sectors dominated by state-owned and traditional private firms before liberalization (with assets, sales and profits representing 50% or higher shares), these firms remain the dominant ownership group following liberalization. Further, rates of return remain stable over time and show low dispersion across sectors and across ownership groups within sectors.

Certainly, the welfare implications of our findings are not clear-cut especially in the light of the current international financial crisis and the increased role of the state in private enterprise in the U.S. and other developed countries. It may, however, be hard to justify the extent of state-owned presence that we continue to see in India. Of course it is not clear whether ownership per se matters or whether exposure to competition through liberalization is a sufficient condition for improvements in efficiency.⁵⁰

Recent literature highlights the idea that economic growth may be impeded not simply because of a lack of resources such as capital, skilled labor and entrepreneurship but also because available resources are misallocated. The high levels of state ownership and ownership by traditional private firms in India raise the question of whether existing resources could be allocated more efficiently and whether remaining barriers to competition jeopardize the effectiveness of reform measures that have been put in place. While rates of return across ownership groups do not display significant dispersion, it is not clear

⁵⁰ One might well argue that the slow/uneven reform process and the small private sector could still be setting "marginal incentives". As Schumpeter (1942) notes, "[monopolistic] competition of the kind we now have in mind acts not only when in being but also when it is merely an ever-present threat. It disciplines before it attacks. The businessman feels himself to be in a competitive situation even if he is alone in his field or if, though not alone, he holds a position such that investigating government experts fail to see any effective competition between him and any other firms in the same or a neighboring field and in consequence conclude that his talk, under examination, about his competitive sorrows is all make-believe."

whether the rates of return for the incumbent groups are being driven by monopoly power that comes with high industry concentration, or through inherent efficiency. A related issue that also arises is whether privatization in the context of high industry concentration may simply replace state-owned monopolies with private ones as it has done in the case of many countries in Latin America.

As discussed in the paper, the macro-economic effects of deregulation are theoretically ambiguous. Further empirical work is needed before we can reach definitive conclusions on the impact of deregulation on the overall dynamic efficiency of the economy.⁵¹ An assessment of the optimality of market reforms requires a full welfare analysis that goes beyond the scope of this paper and will be the subject of our future research.

⁵¹ It is also worth emphasizing that this work does not speak to other welfare and efficiency-improving effects of liberalization linked to improved quality and variety of products, or international risk-sharing.

References

- Aghion, P., R. Burgess, S. Redding, and F. Zilibotti, 2008. "The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India," *American Economic Review* 94, 1397-1412.
- Alesina, A., S. Ardagna, G. Nicoletti and F. Schiantarelli, "Regulation and Investment," *Journal of the European Economic Association* 3, 791-825.
- Alfaro, L., A. Charlton, and F. Kanczuk, 2008. "Plant-Size Distribution and Cross-Country Income Differences." *NBER International Seminar on Macroeconomics*.
- Alfaro, L. and A. Rodríguez-Clare, 2004. "Multinationals and Linkages: Evidence from Latin America," *Economia* 4, 113-170.
- Ahluwalia, M. S., 2002. "Economic Reforms in India Since 1991: Has Gradualism Worked?" *Journal of Economic Perspectives* 16, 67-88.
- Arnold J., B. Javorcik, M. Lipscomb, A. Mattoo, 2008. "Services Reform and Manufacturing Performance: Evidence from India", University of Oxford, mimeo.
- Bai, C., C.-T. Hsieh and Y. Qin, 2006. "The Return to Capital in China," *Brookings Papers in Economic Activity*.
- Banerjee, A., 2006. "The Paradox of Indian Growth: A comment on Kochar et al." *Journal of Monetary Economics* 53, 1021-1026
- Bernard, A., S. Redding, and P. Schott, 2009. "Multi-product Firms and Product Switching," *American Economic Review*, forthcoming.
- Bernard, A., S. Redding, and P. Schott, 2006. "Multi-product Firms and Trade Liberalization," NBER Working Paper 12782.
- Bertrand, M, P. Mehta and S. Mullainathan, 2002. "Ferreting out Tunneling: An Application to Indian Business groups," *Quarterly Journal of Economics*, 121-148.
- Bertrand, M. and Francis K., 2002. "Does Entry Regulation Hinder Job Creation? Evidence from the French Retail Industry," *Quarterly Journal of Economics* 117, 1369-1413.
- Black, S. E. and P. E. Strahan, 2002. "Entrepreneurship and Bank Credit Availability," *Journal of Finance* 57, 2807-2833.
- Blanchard, Olivier J. and Francesco Giavazzi, 2003. "Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Market," *Quarterly Journal of Economics* 118, 879-908.
- Bloom, N. and J. Van Reenen, 2007. "Measuring and Explaining Management Practices across Firms and Countries," *Quarterly Journal of Economics* CXXII, 1341-1408.
- Bloom, N., R. Sadun, and J. Van Reenen, 2007. "The Organization of Firms across Countries," Stanford, mimeo.

- Bosworth, B., S. Collins and A. Virmani, 2007, "Sources of Growth in the Indian Economy," in Suman Bery, Barry Bosworth and Arvind Panagariya (eds.) *India Policy Forum* 3, NCAER & The Brookings Institution.
- Bustos, P., 2009. "Trade Liberalization, Exports and Technology Upgrading: Evidence on the Impact of MERCOSUR on Argentinean Firms," mimeo.
- Caballero, R. and M. Hammour, 1996. "On the Timing and Efficiency of Creative Destruction," *Quarterly Journal of Economics* 446, 805-852.
- Chari, A. and N. Gupta, 2008. "Incumbents and Protectionism: The Political Economy of Foreign Entry Liberalization." *Journal of Financial Economics* 88, 33-656.
- Chong S. and L. Lopez-de-Silanes, 2004. "Privatization in Latin America: What Does the Evidence Say?" *Economia* 4, 37-111.
- Cole, S. A., 2008. "Financial Development, Bank Ownership, and Growth. Or, Does Quantity Imply Quality?" *The Review of Economics and Statistics*, forthcoming.
- Dinc, I. S. and N. Gupta, 2007. "The Decision to Privatize: Finance, Politics and Patronage," mimeo.
- Fisman, R. and T. Khanna, 2004. "Facilitating Development: The Role of Business Groups," *World Development* 32, 609-28.
- Goldberg, P., A. Khandelwal, N. Pavcnik and P. Topalova, 2009. "Trade Liberalization and New Imported Inputs," mimeo.
- Goldberg, P., A. Khandelwal, N. Pavcnik and P. Topalova, 2008. "Imported Intermediate Inputs and Domestic Product Growth: Evidence from India," NBER Working Paper 14416.
- Goldberg, P. and N. Pavcnik, 2004. "Trade, Inequality, and Poverty: What Do We Know? Evidence from Recent Trade Liberalization Episodes in Developing Countries," *Brookings Trade Forum*, 2004.
- Guiso, L., P. Sapienza and L. Zingales, 2004. "Does Local Financial Development Matter?" *Quarterly Journal of Economics* 119, 929-969.
- Gupta, N., 2005. "Partial Privatization and Firm Performance," *The Journal of Finance*, Vol. LX, No. 2, 987-1015.
- Hsieh, C.-T. and Klenow, P. J., 2008. "Misallocation and Manufacturing TFP in China and India" *Quarterly Journal of Economics*, forthcoming.
- Henry, P., 2007. "Capital Account Liberalization: Theory, Evidence, and Speculation," *Journal of Economic Literature* 45, 887-935.
- Harrison, A. and A. Rodriguez-Clare, 2008. "Trade, Foreign Investment, and Industrial Policy," *Handbook of Development Economics*, forthcoming.

- Khanna, T. and K. Palepu, 1999. "Policy Shocks, Market Intermediaries and Corporate Strategy: the Evolution of Business Groups in Chile and India," *Journal of Economics & Management Strategy* 8, 271-310.
- Khanna, T. and K. Palepu, 2005. "The Evolution of Concentrated Ownership in India: Broad Patterns and a History of the Indian Software Industry," in Randall Morck, eds., *A History of Corporate Governance around the World: Family Business Groups to Professional Managers*, University of Chicago Press.
- Klenow, P., 2008. "Discussion On Big Answers for Big Questions: The Presumption of Macro", May 2008, The Brookings Institution Conference on What Works in Development? Thinking Big and Thinking Small.
- Kochhar, K., U. Kumar, R. Rajan, A. Subramanian, and I. Tokatlidis, 2006. "India's Pattern of Development: What Happened, What Follows," *Journal of Monetary Economics* 53, 981-1019.
- Kose, A. M., E. Prasad, K. Rogoff, S.-J. Wei, and M. Ayhan Kose, 2006. "Financial Globalization: A Reappraisal," NBER Working Paper 12484..
- Krishna, P. and D. Mitra, 1998. "Trade Liberalization, Market Discipline and Productivity Growth: New Evidence from India." *Journal of Development Economics* 56, 447-462.
- Kroszner, R. and P. E. Strahan, 1999. "What Drives Deregulation? Economics and Politics of the Relaxation of Bank Branching Restrictions," *Quarterly Journal of Economics*, 1437-67.
- Lileeva, A. and D. Trefler, 2007. "Improved Access to Foreign Markets Raises Plant-Level Productivity... for Some Plants," mimeo.
- Lucas, R. Jr., 1988. "On the Mechanics of Economic Development," *Journal of Monetary Economics* 22, 3-42.
- Meggison, W. L. and J. M. Netter, 2001. "From State to Market: A Survey of Empirical Studies on Privatization," *Journal of Economic Literature* 39, 321-389.
- Meggison, W. L., 2005. *The Financial Economics of Privatization*, Oxford University Press: New York, NY.
- Melitz, M. J., 2003. "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity," *Econometrica* 71, 1695-1725.
- Melitz, M. and G. Ottaviano, 2008. "Market Size, Trade, and Productivity," *Review of Economic Studies* 75, 295-316.
- Panagariya, A., 2004. "India in the 1980s and 1990s: A Triumph of Reforms," IMF Staff Country Reports, 1-37.
- Panagariya, A., 2008. *India, the Emerging Giant*, Oxford University Press: New York, NY.

- Rajan, R., Zingales, L., 2003a. "The Great Reversals: The Politics of Financial Development in the Twentieth Century." *Journal of Financial Economics* 69, 5-50.
- Rajan, R., Zingales, L., 2003b. *Saving Capitalism from Capitalists*. Random House: New York.
- Rodrik, D. and A. Subramanian, 2005. "From Hindu Growth to Productivity Surge: The Mystery of the Indian Growth Transition," *IMF Staff Papers*, Vol. 52, No. 2.
- Schumpeter, J. A., 1942. *Capitalism, Socialism and Democracy*, Unwin University Books, London.
- Sivadasan, J., 2006. "Productivity Consequences of Product Market Liberalization: Microevidence from Indian Manufacturing Sector Reforms." October 2006.
- Srinivasan, T.N. and S.D. Tendulkar, 2003. *Reintegrating India with the World Economy*. Peterson Institute of International Economics.
- Stigler, G. J. 1971. "The Theory of Economy Regulation," *Bell Journal of Economics* 2(1), 3-21.
- Topalova, P., 2007. "Trade Liberalization and Firm Productivity: The Case of India," IMF Working Paper, WP/04/28.
- Tybout, J., 2000. "Manufacturing Firms in Developing Countries: How Well Do They Do and Why?" *Journal of Economic Literature* 38, 11-44.
- World Bank, 2005. "Improving the Investment Climate in India", South Asia Region and Investment Climate Unit, Washington DC: World Bank.

Appendix Table 1 - Description of Variables

Variables	Definition
<i>State-Owned (SOE)</i>	Firms majority-owned by the federal and state governments.
<i>Traditional Private Firms</i>	Includes firms majority-owned by a business group and private firms not affiliated to a group incorporated before 1985. Indian business groups or family-owned firms are groups of companies that are controlled by the same shareholders, usually all members of a family.
<i>New Private Firms</i>	Includes firms majority-owned by a business group and private firms not affiliated to a group incorporated after 1985.
<i>Foreign Firms</i>	Firms incorporated overseas.
<i>Sales</i>	Sales generated by a firm from its main business activity measured by charges to customers for goods supplied and services rendered. Excludes income from activities not related to main business, such as dividends, interest, and rents in the case of industrial firms, as well as non-recurring income. Data in constant Rs. Crore (deflated by GDP deflator from World Bank, WDI).
<i>Assets</i>	Gross fixed assets of a firm, which includes movable and immovable assets as well as assets which are in the process of being installed. Data in constant Rs. Crore (deflated by GDP deflator from World Bank, WDI).
<i>PBITDA</i>	Excess of income over all expenditures except tax, depreciation, interest payments, and rents in a firm. Data in constant Rs. Crore (deflated by GDP deflator from World Bank, WDI).
<i>Return on Assets</i>	Ratio of <i>PBITDA</i> to <i>Assets</i> in a firm, averaged across firms in that industry.
<i>Firm Size (Assets & Sales) and Profits</i>	Average firm assets, sales, and profits in an industry. For the full sample, the industry-level averages are averaged across industries. Data in constant Rs. Crore (deflated by GDP deflator from World Bank, WDI).
<i>SOE Share</i>	The ratio of total sales, assets, profits produced by state-owned firms in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>Traditional Firms Share</i>	The ratio of total sales, assets, profits produced by private firms incorporated before 1985 in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>New Private Firms Share</i>	The ratio of total sales, assets, profits produced by private firms incorporated after 1985 in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>Foreign Share</i>	The ratio of total sales, assets, profits produced by foreign firms in an industry to <i>Industry Sales</i> , <i>Industry Assets</i> , <i>Industry Profits</i> in that industry.
<i>Herfindahl Index</i>	Sum of the squares of the <i>Market Share</i> of all firms in an industry in each 3-digit industrial category.
<i>Coefficient of Variation</i>	Ratio of standard deviation to mean of assets, sales, return on assets at the industry level
<i>Tade liberalization measure</i>	Percentage decrease in tariffs at the three-digit industry level between 1986-1990 and 1991-1995.
<i>NIC Code</i>	Three-digit industry code includes manufacturing, financial, and service sectors.

Appendix Table 2: Industry Classifications

Industry Name	3 digit NIC code	# Firms	Industry Name	3 digit NIC code	# Firms
1. Agriculture, mining, extraction			3. Chemicals and plastics manufacturing		
Coal & lignite	101, 102	16	Abrasives	269	11
Cotton & blended yarn	11, 14	6	Alkalies	241	13
Crude oil & natural gas	111	9	Cement	269	113
Floriculture	11	27	Ceramic tiles	269	44
Granite	141	46	Comp., & storage devices	252	2
Minerals	101, 103, 120, 131, 132, 141, 142	81	Cosm., toiletries, soaps & detergents	242	86
Other agricultural products	11, 12, 14, 20, 142	149	Drugs & pharmaceuticals	242	442
Other construction & allied activities	112	12	Dyes & pigments	241, 242	73
Other textiles	11	2	Fertilisers	241	60
Poultry & meat products	11, 12	16	Glass & glassware	261	48
Processed/package foods	11	22	Inorganic chemicals	241, 242	86
Rubber & rubber products	11	11	Misc. electrical machinery	269	3
Tobacco products	11	5	Organic chemicals	241	134
Vegetable oils & products	11	0	Other chemicals	241, 242	124
Wood	20	6	Other non-metallic mineral products	269	29
2. Food, textile, and paper manufacturing			Other recreational services	252	4
Bakery products	154	21	Other textiles	252	1
Beer & alcohol	155	95	Paints & varnishes	242	34
Books & cards	210, 221, 222	60	Pesticides	241, 242	86
Cloth	171	148	Plastic films	252	40
Coal & lignite	231	11	Plastic packaging goods	252	105
Cocoa products & confectionery	154	9	Plastic tubes & sheets, other	252	162
Coffee	154	19	Polymers	241	55
Comp., & storage devices	221	1	Prod., distribution & exhib. of films	242	0
Cotton & blended yarn	171	336	Refractories	269	32
Dairy products	152, 154	46	Rubber & rubber products	241, 251	82
Footwear	192	47	Synthetic textiles	243	100
Lubricants, etc.	232	46	Textile processing	243	57
Marine foods	151	71	Tyres & tubes	251	34
Media-print	221	35	4. Metals and industrial manufacturing		
Milling products	153, 155	59	Air-conditioners & refrigerators	291, 293	16
Misc. manufactured articles	232	1	Aluminium & aluminium products	272	53
Other agricultural products	155	2	Automobile ancillaries	343	307
Other industrial machinery	172	1	Castings & forgings	273, 289	123
Other leather products	191	36	Commercial vehicles	341	5
Other recreational services	223	2	Communication equipment	319, 322, 331	45
Other storage & distribution	232	5	Computers & peripherals	300	46
Other textiles	171, 172, 173, 181	189	Construction equipment	291, 292	39
Paper	210	154	Consumer electronics	300, 321, 323	34
Paper products	210	46	Copper & copper products	272	30
Poultry & meat products	151, 154	14	Domestic electrical appliances	289, 292, 293, 315	52
Processed/package foods	151, 153, 154, 155	81	Dry cells	314	5
Readymade garments	181	120	Gems & jewellery	369	84
Refinery	232	12	General purpose machinery	291	84
Starches	153	9	Generators, transf. & switchgears	319	111
Sugar	154	99	Industrial machinery	291, 292, 300	137
Synthetic textiles	171, 172	19	Machine tools	292	60
Tea	154	173	Metal products	271, 281, 289, 361	218
Textile processing	171	68	Misc. electrical machinery	291, 292, 312, 319	44
Tobacco products	155, 160	20	Misc. manufactured articles	369	68
Vegetable oils & products	151, 152, 153	224	Other electronics	314, 319, 321, 322,	194
Wood	201, 202	41	Other industrial machinery	291, 292	24

Appendix Table A2 (cont.): Industry Classifications

Industry Name	3 digit NIC code	# Firms	Industry Name	3 digit NIC code	# Firms
4. Metals and industrial manufacturing (cont.)			8. Financial services, real estate		
Other non-ferrous metals	272	30	Banking services	651	164
Other transports equipment	351, 352, 353, 359	38	Brokers	659, 671	72
Passenger cars & multi utility vehicles	341	8	Business consultancy	671	21
Pig iron	271	10	Commercial complexes	701, 702	167
Prime movers	281, 291	24	Computer software	701	5
Sponge iron	271	21	Drugs & pharmaceuticals	701	0
Steel	271	327	Financial institutions	659	44
Steel tubes & pipes	271	85	Housing finance services	659	49
Storage batteries	314	8	Non-banking financial cos. (NBFCs)	659	374
Tobacco products	369	4	Other financial services	659, 660	1697
Tractors	292	9	Readymade garments	701	1
Trading	293	1	Securities and stock traders	659	1395
Two & three wheelers	359	16	9. Business, computer, and communication services		
Wires & cables	313	80	Business consultancy	742, 743, 749	342
5. Utilities, construction, retail			Computer software	722	451
Copper & copper products	511	1	Courier services	641	10
Electricity distribution	401	21	ITES	722	50
Electricity generation	401	116	Other const. & allied activities	742	5
Housing construction	452	118	Other misc services	731, 741	9
Industrial construction	452	105	Telecommunication services	642	74
Infrastructural construction	452	56	10. Misc. diversified		
Irrigation	410	3	Diversified	970	52
LNG storage & distribution	402	4	Misc. manufactured articles	970	382
Other construction & allied activities	452, 453	83			
Other misc services	502, 519, 521, 526	180			
Other storage & distribution	402	7			
Retail trading	521, 523	15			
Trading	514, 515, 519	1293			
6. Transport					
Air transport infrastructure services	630	3			
Air transport services	621	19			
Other storage & distribution	603, 630	30			
Railway transport services	601	4			
Road transport infrastructure services	630	10			
Road transport services	602	48			
Shipping transport infrastructure service	611, 612, 630	10			
Shipping transport services	611, 612	63			
Tourism	630	19			
Transport logistics services	602, 630	63			
7. Hospitality, tourism, media, health, and other services					
Animation content provider	924	4			
Exhibition of films	924	12			
Health services	851	74			
Hotels & restaurants	551, 552	203			
Media-broadcasting	922	28			
Media-content	924	23			
Other financial services	753	1			
Other misc services	809, 851, 911, 919	91			
Other recreational services	921, 924	46			
Production, distribution & exhibition of	921	22			
Tourism	552	9			

Table A: Egypt, India and Indonesia--Economic Growth (1975-2005)

	1975-1985	1986-2007	1996-2005
	<u>Real GDP Growth Rates</u>		
India	4.1%	6.0%	6.3%
Egypt	8.3%	4.2%	4.3%
Indonesia	6.8%	4.9%	2.8%
	<u>Real Per Capita Growth Rates</u>		
India	1.9%	4.3%	4.6%
Egypt	5.8%	2.3%	2.4%
Indonesia	4.6%	3.4%	0.8%

Notes: Average growth rate of GDP and GDP per capita (constant 2000 US\$), from World Bank Development Indicators.

Table 1: Industrial Composition--Average Number of Firms, 1988-2005

Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005	Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005
<u>Full Sample</u>						<u>Hospitality, Tourism, Media, Health, & Other services</u>					
State	645	665	693	684	617	State	16	17	17	17	16
Private (Inc. pre-1985)	7,551	7,413	6,903	6,317	5,685	Private (Inc. pre-1985)	198	198	194	186	173
Private (Inc. post-1985)	3,031	6,381	9,233	9,616	8,864	Private (Inc. post-1985)	104	206	341	411	404
Foreign	533	678	856	850	748	Foreign	18	20	25	28	26
<u>Agriculture, mining, extraction</u>						<u>Financial services, real estate</u>					
State	42	44	43	41	39	State	185	202	220	212	197
Private (Inc. pre-1985)	145	143	134	126	112	Private (Inc. pre-1985)	1,861	1,858	1,779	1,669	1,538
Private (Inc. post-1985)	99	221	289	279	255	Private (Inc. post-1985)	656	1,652	2,566	2,561	2,404
Foreign	6	8	13	14	13	Foreign	80	117	157	148	129
<u>Food, Textile, & Paper Mfg.</u>						<u>Business, Computer, & Communication services</u>					
State	83	77	73	66	56	State	24	28	30	32	28
Private (Inc. pre-1985)	1,328	1,284	1,171	1,049	907	Private (Inc. pre-1985)	266	265	260	248	225
Private (Inc. post-1985)	504	1,048	1,293	1,269	1,109	Private (Inc. post-1985)	133	360	711	923	875
Foreign	68	85	101	89	73	Foreign	34	56	93	117	98
<u>Chemicals & Plastics Mfg.</u>						<u>Misc. diversified</u>					
State	56	57	56	49	46	State	5	4	4	6	6
Private (Inc. pre-1985)	1,150	1,121	1,025	910	816	Private (Inc. pre-1985)	156	153	150	145	134
Private (Inc. post-1985)	527	929	1,081	1,030	916	Private (Inc. post-1985)	78	173	338	391	392
Foreign	120	135	147	139	123	Foreign	7	9	15	17	16
<u>Metals and Industrial Mfg.</u>						<u>Full Sample</u>					
State	97	97	94	83	73	Industry/Period	I	II	III	IV	V
Private (Inc. pre-1985)	1,450	1,406	1,264	1,115	995	Agri., mining, extrac.	292	416	479	460	419
Private (Inc. post-1985)	521	916	1,198	1,166	1,045	Food, Text., Pap. Mfg	1,983	2,494	2,637	2,473	2,144
Foreign	135	159	191	181	160	Chem., Plastics Mfg.	1,853	2,242	2,309	2,128	1,901
<u>Utilities, construction, retail</u>						Metals, Ind. Mfg	2,204	2,578	2,747	2,545	2,272
State	103	105	116	135	124	Util., Construct., Retail	1,421	1,857	2,315	2,422	2,207
Private (Inc. pre-1985)	892	882	828	775	702	Transport	186	236	298	329	316
Private (Inc. post-1985)	370	796	1,279	1,415	1,293	Hosp, Tour. , & other	336	441	578	642	618
Foreign	55	75	92	97	89	Financ., real estate	2,782	3,828	4,722	4,590	4,267
<u>Transport</u>						Bus., Comp., & Comm.	456	709	1,094	1,321	1,225
State	33	36	40	42	34	Misc. diversified	246	338	506	559	547
Private (Inc. pre-1985)	104	104	99	95	87						
Private (Inc. post-1985)	40	80	138	171	174						
Foreign	9	16	21	21	22						

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 2: Industrial Composition--Average Total Assets, 1988-2005 (Constant Rs. Crore)

Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005	Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005
<u>Full Sample</u>						<u>Hospitality, Tourism, Media, Health, & Other services</u>					
State	198,288	384,355	551,184	808,408	969,039	State	40	153	246	257	341
Private (Inc. pre-1985)	73,013	134,655	224,185	246,071	269,427	Private (Inc. pre-1985)	730	1,258	3,133	6,129	5,672
Private (Inc. post-1985)	3,079	24,090	82,517	167,759	244,100	Private (Inc. post-1985)	18	250	1,084	2,878	4,526
Foreign	14,547	36,319	68,390	99,833	117,171	Foreign	32	120	305	527	510
<u>Agriculture, mining, extraction</u>						<u>Financial services, real estate</u>					
State	8,523	24,821	29,117	36,988	49,479	State	115,481	239,529	376,073	535,430	633,167
Private (Inc. pre-1985)	297	644	1,053	1,176	1,571	Private (Inc. pre-1985)	5,963	25,834	59,802	66,747	70,690
Private (Inc. post-1985)	36	600	1,567	2,684	2,874	Private (Inc. post-1985)	380	5,295	23,429	69,535	110,035
Foreign	46	231	288	352	452	Foreign	2,546	18,287	34,660	51,801	63,953
<u>Food, Textile, & Paper Mfg.</u>						<u>Business, Computer, & Communication services</u>					
State	15,080	17,540	30,602	43,080	47,737	State	3,329	5,717	6,847	38,517	43,438
Private (Inc. pre-1985)	12,512	21,842	34,255	43,580	50,666	Private (Inc. pre-1985)	460	796	1,866	4,490	6,555
Private (Inc. post-1985)	372	4,444	15,980	18,749	20,381	Private (Inc. post-1985)	333	1,308	7,204	19,674	28,885
Foreign	2,259	3,816	5,203	6,258	7,644	Foreign	53	197	1,285	4,337	5,987
<u>Chemicals & Plastics Mfg.</u>						<u>Misc. diversified</u>					
State	7,119	7,197	8,166	7,310	6,479	State	532	348	404	386	382
Private (Inc. pre-1985)	20,127	30,528	43,591	44,016	45,664	Private (Inc. pre-1985)	3,392	4,588	5,212	4,491	4,608
Private (Inc. post-1985)	806	4,832	11,033	14,251	18,938	Private (Inc. post-1985)	152	638	1,242	1,436	1,842
Foreign	4,336	5,473	9,357	12,733	13,795	Foreign	189	165	154	167	235
<u>Metals and Industrial Mfg.</u>						<u>Full Sample</u>					
State	27,872	32,737	31,148	27,140	32,028	Industry/Period	I	II	III	IV	V
Private (Inc. pre-1985)	21,130	33,715	51,047	50,570	56,805	Agri., mining, extrac.	8,903	26,296	32,025	41,200	54,375
Private (Inc. post-1985)	692	4,747	12,556	20,358	23,987	Food, Text., Pap. Mfg	30,223	47,641	86,040	111,666	126,429
Foreign	4,770	7,490	14,461	17,893	19,694	Chem., Plastics Mfg.	32,388	48,031	72,148	78,310	84,876
<u>Utilities, construction, retail</u>						Metals, Ind. Mfg	54,464	78,688	109,212	115,961	132,514
State	19,047	48,894	59,622	107,182	143,278	Util., Construct., Retail	26,849	64,279	90,586	147,582	197,580
Private (Inc. pre-1985)	7,256	13,227	21,425	21,926	23,496	Transport	2,469	10,003	13,320	20,550	23,138
Private (Inc. post-1985)	241	1,704	7,560	14,900	28,475	Hosp, Tour. , & other	820	1,781	4,768	9,791	11,049
Foreign	305	454	1,980	3,574	2,331	Financ., real estate	124,370	288,944	493,963	723,513	877,845
<u>Transport</u>						Bus., Comp., & Comm.	4,176	8,017	17,202	67,018	84,865
State	1,265	7,420	8,960	12,118	12,710	Misc. diversified	4,264	5,739	7,012	6,480	7,067
Private (Inc. pre-1985)	1,146	2,224	2,800	2,946	3,702						
Private (Inc. post-1985)	48	273	863	3,296	4,156						
Foreign	10	86	698	2,190	2,570						

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 3: Industrial Composition--Average Gross Sales, 1988-2005 (Constant Rs. Crore)

Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005	Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005
<u>Full Sample</u>						<u>Hospitality, Tourism, Media, Health, & Other services</u>					
State	67,121	90,617	129,745	203,605	256,972	State	29	123	226	181	185
Private (Inc. pre-1985)	72,047	96,737	128,494	150,568	187,815	Private (Inc. pre-1985)	367	616	1,175	1,405	1,678
Private (Inc. post-1985)	2,566	13,094	38,155	72,986	103,229	Private (Inc. post-1985)	3	64	280	941	1,495
Foreign	17,748	22,774	35,473	47,240	59,091	Foreign	17	58	147	205	297
<u>Agriculture, mining, extraction</u>						<u>Financial services, real estate</u>					
State	5,486	10,462	16,098	20,974	26,712	State	195	364	538	407	414
Private (Inc. pre-1985)	253	477	830	857	1,307	Private (Inc. pre-1985)	2,280	2,568	3,597	4,797	4,429
Private (Inc. post-1985)	22	276	955	1,869	2,470	Private (Inc. post-1985)	42	179	390	466	898
Foreign	81	173	181	209	465	Foreign	40	44	56	22	76
<u>Food, Textile, & Paper Mfg.</u>						<u>Business, Computer, & Communication services</u>					
State	29,059	31,898	52,401	88,011	103,620	State	996	1,526	2,180	9,987	12,739
Private (Inc. pre-1985)	14,795	20,236	26,214	39,253	46,606	Private (Inc. pre-1985)	565	813	1,683	3,639	5,576
Private (Inc. post-1985)	483	3,182	9,124	18,631	18,808	Private (Inc. post-1985)	185	1,287	4,046	7,822	12,958
Foreign	4,086	5,669	7,149	8,518	9,003	Foreign	29	140	566	2,405	4,029
<u>Chemicals & Plastics Mfg.</u>						<u>Misc. diversified</u>					
State	4,729	5,104	5,405	6,056	6,208	State	680	341	372	343	381
Private (Inc. pre-1985)	19,989	26,667	34,097	35,660	41,531	Private (Inc. pre-1985)	3,253	3,902	3,936	3,454	4,176
Private (Inc. post-1985)	629	2,815	7,041	11,082	15,295	Private (Inc. post-1985)	288	619	1,031	1,058	1,401
Foreign	6,647	7,834	11,753	14,474	14,804	Foreign	582	427	291	394	486
<u>Metals and Industrial Mfg.</u>						<u>Full Sample</u>					
State	14,492	15,981	16,046	16,407	21,394	Industry/Period	I	II	III	IV	V
Private (Inc. pre-1985)	23,583	30,563	41,587	43,286	59,202	Agri., mining, extrac.	5,842	11,387	18,064	23,908	30,954
Private (Inc. post-1985)	639	3,230	9,172	17,908	26,992	Food, Text., Pap. Mfg	48,423	60,984	94,887	154,413	178,038
Foreign	5,499	7,406	13,128	16,890	25,225	Chem., Plastics Mfg.	31,994	42,419	58,296	67,272	77,837
<u>Utilities, construction, retail</u>						Metals, Ind. Mfg	44,212	57,181	79,932	94,491	132,813
State	10,615	21,984	31,645	54,346	77,522	Util., Construct., Retail	17,942	34,095	52,904	85,562	122,535
Private (Inc. pre-1985)	6,313	9,846	13,980	16,243	20,770	Transport	1,518	4,082	7,273	11,226	13,713
Private (Inc. post-1985)	262	1,281	5,637	12,080	21,236	Hosp, Tour. , & other	416	862	1,829	2,732	3,656
Foreign	751	984	1,642	2,893	3,006	Financ., real estate	2,558	3,155	4,580	5,693	5,817
cont.						Bus., Comp., & Comm.	1,774	3,767	8,474	23,852	35,302
<u>Transport</u>						Misc. diversified	4,803	5,289	5,630	5,250	6,444
State	840	2,834	4,835	6,892	7,798						
Private (Inc. pre-1985)	649	1,049	1,397	1,974	2,540						
Private (Inc. post-1985)	13	159	480	1,130	1,675						
Foreign	15	39	561	1,230	1,699						

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 4: Industrial Composition-- Average Profits (PBDIT), 1988-2005 (Constant Rs. Crore)

Owner/Period	I	II	III	IV	V	Owner/Period	I	II	III	IV	V
	1988-1990	1991-1994	1995-1998	1999-2002	2003-2005		1988-1990	1991-1994	1995-1998	1999-2002	2003-2005
<u>Full Sample</u>						<u>Hospitality, Tourism, Media, Health, & Other services</u>					
State	15,421	32,029	50,140	72,050	82,753	State	3	21	36	11	12
Private (Inc. pre-1985)	10,032	17,326	25,484	25,893	33,252	Private (Inc. pre-1985)	95	197	459	448	506
Private (Inc. post-1985)	402	2,552	6,693	13,213	19,562	Private (Inc. post-1985)	1	23	72	178	283
Foreign	2,130	4,196	7,783	10,371	12,886	Foreign	6	23	42	45	62
<u>Agriculture, mining, extraction</u>						<u>Financial services, real estate</u>					
State	767	3,731	4,905	7,031	10,571	State	7,709	16,874	29,855	40,125	37,802
Private (Inc. pre-1985)	38	88	110	111	369	Private (Inc. pre-1985)	714	2,935	6,724	5,909	5,791
Private (Inc. post-1985)	7	67	143	254	356	Private (Inc. post-1985)	49	565	2,026	4,295	6,480
Foreign	9	33	30	26	143	Foreign	210	1,338	3,224	4,059	3,669
<u>Food, Textile, & Paper Mfg.</u>						<u>Business, Computer, & Communication services</u>					
State	2,089	2,123	3,406	5,376	7,395	State	436	819	1,347	5,160	6,876
Private (Inc. pre-1985)	1,847	2,959	3,841	5,341	6,848	Private (Inc. pre-1985)	67	127	332	1,022	1,559
Private (Inc. post-1985)	49	401	948	1,666	1,557	Private (Inc. post-1985)	81	276	914	2,113	3,228
Foreign	442	720	923	1,195	1,504	Foreign	3	34	115	594	1,202
<u>Chemicals & Plastics Mfg.</u>						<u>Misc. diversified</u>					
State	608	824	707	390	580	State	57	34	33	11	8
Private (Inc. pre-1985)	2,909	4,343	5,269	5,090	6,120	Private (Inc. pre-1985)	365	555	521	350	569
Private (Inc. post-1985)	76	472	934	1,441	1,968	Private (Inc. post-1985)	23	84	112	114	161
Foreign	754	1,029	1,573	2,313	2,584	Foreign	40	41	28	51	58
<u>Metals and Industrial Mfg.</u>						<u>Full Sample</u>					
State	2,204	2,508	2,598	1,944	5,118	Industry/Period	I	II	III	IV	V
Private (Inc. pre-1985)	2,955	4,277	5,847	5,265	8,535	Agri., mining, extrac.	820	3,920	5,188	7,422	11,440
Private (Inc. post-1985)	77	480	981	1,707	2,771	Food, Text., Pap. Mfg	4,428	6,204	9,118	13,578	17,304
Foreign	640	914	1,570	1,576	3,005	Chem., Plastics Mfg.	4,347	6,668	8,484	9,235	11,252
<u>Utilities, construction, retail</u>						Metals, Ind. Mfg	5,876	8,179	10,996	10,493	19,430
State	1,374	4,446	6,440	10,661	12,796	Util., Construct., Retail	2,247	6,118	9,162	13,998	17,580
Private (Inc. pre-1985)	812	1,462	2,037	1,944	2,271	Transport	408	1,067	1,311	2,318	3,184
Private (Inc. post-1985)	35	156	482	1,061	2,297	Hosp, Tour. , & other	105	264	609	682	862
Foreign	26	54	204	332	216	Financ., real estate	8,682	21,712	41,829	54,388	53,741
<u>Transport</u>						Bus., Comp., & Comm.	587	1,256	2,708	8,888	12,865
State	172	649	814	1,341	1,596	Misc. diversified	485	713	695	526	796
Private (Inc. pre-1985)	231	382	344	412	684						
Private (Inc. post-1985)	5	27	80	384	461						
Foreign	0	9	73	180	442						

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 5: Industrial Composition--Average Return on Assets, 1988-2005

Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005	Owner/Period	I 1988- 1990	II 1991- 1994	III 1995- 1998	IV 1999- 2002	V 2003- 2005
<u>Full Sample</u>						<u>Hospitality, Tourism, Media, Health, & Other services</u>					
State	8.90	9.54	10.26	9.21	10.61	State	2.82	13.32	14.29	0.70	3.42
Private (Inc. pre-1985)	13.53	12.78	11.54	10.66	12.39	Private (Inc. pre-1985)	13.16	15.59	16.06	7.33	8.90
Private (Inc. post-1985)	12.93	11.81	8.35	8.11	8.54	Private (Inc. post-1985)	2.06	8.51	6.65	6.22	6.23
Foreign	12.36	14.18	12.44	12.50	14.94	Foreign	17.95	19.45	14.22	8.50	12.09
<u>Agriculture, mining, extraction</u>						<u>Financial services, real estate</u>					
State	8.81	15.29	16.82	18.75	21.27	State	6.55	7.08	7.93	7.50	6.00
Private (Inc. pre-1985)	13.39	13.48	10.51	9.40	22.91	Private (Inc. pre-1985)	12.77	11.30	11.30	8.88	8.19
Private (Inc. post-1985)	19.77	11.02	9.27	9.48	12.38	Private (Inc. post-1985)	12.77	12.04	9.00	6.30	5.92
Foreign	18.93	15.21	10.39	7.60	30.04	Foreign	8.37	7.60	9.37	7.84	5.76
<u>Food, Textile, & Paper Mfg.</u>						<u>Business, Computer, & Communication services</u>					
State	13.97	12.14	11.16	12.41	15.63	State	13.27	14.18	19.67	13.23	15.85
Private (Inc. pre-1985)	14.68	13.58	11.23	12.28	13.50	Private (Inc. pre-1985)	14.59	16.00	17.33	23.01	23.65
Private (Inc. post-1985)	12.62	9.69	6.23	8.67	7.64	Private (Inc. post-1985)	16.29	22.13	13.15	11.42	11.07
Foreign	19.41	19.06	17.70	19.11	19.69	Foreign	5.28	16.42	9.74	13.79	20.09
<u>Chemicals & Plastics Mfg.</u>						<u>Misc. diversified</u>					
State	8.54	11.46	8.67	5.47	8.96	State	11.02	9.83	8.19	2.83	2.03
Private (Inc. pre-1985)	14.44	14.19	12.15	11.57	13.40	Private (Inc. pre-1985)	10.69	12.05	9.82	7.76	12.33
Private (Inc. post-1985)	9.39	9.98	8.49	10.05	10.40	Private (Inc. post-1985)	14.34	13.70	9.30	7.89	8.73
Foreign	17.36	18.95	16.88	18.14	18.73	Foreign	22.48	25.16	18.18	30.67	24.79
<u>Metals and Industrial Mfg.</u>						<u>Full Sample</u>					
State	7.99	7.66	8.36	7.10	15.74	Industry/Period	I	II	III	IV	V
Private (Inc. pre-1985)	13.97	12.73	11.51	10.39	14.97	Agri., mining, extrac.	17.31	12.07	10.20	10.14	16.14
Private (Inc. post-1985)	11.14	10.41	7.87	8.37	11.48	Food, Text., Pap. Mfg	13.78	11.75	8.92	10.69	10.80
Foreign	13.40	12.24	11.24	8.81	15.22	Chem., Plastics Mfg.	12.02	12.37	10.58	11.10	12.16
<u>Utilities, construction, retail</u>						Metals, Ind. Mfg	12.45	11.48	9.73	9.26	13.42
State	6.97	9.05	10.77	10.07	8.95	Util., Construct., Retail	13.07	10.56	7.71	7.88	8.68
Private (Inc. pre-1985)	11.21	11.11	9.54	8.88	9.66	Transport	13.16	11.82	10.13	11.96	13.54
Private (Inc. post-1985)	14.92	10.34	6.36	7.05	8.11	Hosp, Tour. , & other	5.69	10.93	9.64	6.43	7.07
Foreign	8.35	11.73	9.38	9.51	9.24	Financ., real estate	12.35	11.42	9.78	7.32	6.73
<u>Transport</u>						Bus., Comp., & Comm.	16.39	20.36	13.80	13.71	14.15
State	15.20	8.94	9.08	11.07	12.56	Misc. diversified	13.70	13.58	9.64	8.39	9.81
Private (Inc. pre-1985)	19.79	17.14	12.38	14.00	18.30						
Private (Inc. post-1985)	11.19	10.44	9.14	11.60	11.09						
Foreign	-0.70	7.96	11.53	8.56	17.04						

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 6: Return on Assets--Cross-Sectional Variance, 1988-2005

Return on Assets (%): Dispersion					
Industry/ Period	I 1988-1990	II 1991-1994	III 1995-1998	IV 1999-2002	V 2003-2005
FullSample (across owners)	4.63	4.64	4.09	4.38	6.39
Agriculture, mining, extraction	10.96	4.27	7.55	11.15	17.66
Food, Textile, & Paper Mfg.	6.79	9.37	11.46	10.44	12.05
Chemicals & Plastics Mfg.	8.83	8.97	8.38	12.67	9.78
Metals & Industrial Mfg	5.97	5.06	3.64	3.28	4.26
Utilities, Construction, Retail	7.95	2.68	4.41	3.02	1.55
Transport	20.49	9.18	3.30	5.44	7.21
Hospitality, Tourism, Media, Health, &	15.89	10.94	9.41	7.80	8.66
Financial services, real estate	6.22	4.96	3.37	2.58	2.44
Business, Computer, & Communication	11.01	7.95	9.92	11.59	12.58
Misc. diversified	11.79	15.32	9.99	27.84	22.76
Full Sample (Across Industries)	11.62	9.80	6.09	7.27	9.41

Return on Asset: Coefficient of Variation					
Industry/ Period	I 1988-1990	II 1991-1994	III 1995-1998	IV 1999-2002	V 2003-2005
FullSample (across owners)	0.17	0.16	0.17	0.19	0.23
Agriculture, mining, extraction	0.34	0.15	0.29	0.45	0.34
Food, Textile, & Paper Mfg.	0.19	0.29	0.41	0.33	0.36
Chemicals & Plastics Mfg.	0.34	0.29	0.34	0.46	0.34
Metals & Industrial Mfg	0.23	0.21	0.19	0.16	0.14
Utilities, Construction, Retail	0.34	0.11	0.21	0.15	0.07
Transport	0.77	0.37	0.16	0.20	0.24
Hospitality, Tourism, Media, Health, &	0.87	0.32	0.33	0.61	0.48
Financial services, real estate	0.31	0.27	0.15	0.14	0.18
Business, Computer, & Communication	0.39	0.20	0.29	0.34	0.31
Misc. diversified	0.37	0.45	0.40	1.02	0.80
Full Sample (Across Industries)	0.24	0.22	0.15	0.23	0.28

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 7: Industrial Composition--Fraction of Average Number of Firms, Assets, Sales and Profits, 1998-2005

Number of Firm						Total Assets					Total Sales					Profits (PBDIT)							
	I	II	III	IV	V		I	II	III	IV	V		I	II	III	IV	V		I	II	III	IV	V
Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2005	Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2005	Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2005	Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2005
<u>Full Sample</u>						<u>Full Sample</u>					<u>Full Sample</u>					<u>Full Sample</u>							
State	5%	4%	4%	4%	4%	State	69%	66%	60%	61%	61%	State	42%	41%	39%	43%	42%	State	55%	57%	56%	59%	56%
Pr. Pre-85	64%	49%	39%	36%	36%	Pr. Pre-85	25%	23%	24%	19%	17%	Pr. Pre-85	45%	43%	39%	32%	31%	Pr. Pre-85	36%	31%	28%	21%	22%
Pr. Post-85	26%	42%	52%	55%	56%	Pr. Post-85	1%	4%	9%	13%	15%	Pr. Post-85	2%	6%	11%	15%	17%	Pr. Post-85	1%	5%	7%	11%	13%
Foreign	5%	4%	5%	5%	5%	Foreign	5%	6%	7%	8%	7%	Foreign	11%	10%	11%	10%	10%	Foreign	8%	7%	9%	9%	9%
<u>Agric., mining, extraction</u>						<u>Agric., mining, extraction</u>					<u>Agric., mining, extraction</u>					<u>Agric., mining, extraction</u>							
State	14%	10%	9%	9%	9%	State	96%	94%	91%	90%	91%	State	94%	92%	89%	88%	86%	State	94%	95%	95%	95%	92%
Pr. Pre-85	50%	34%	28%	27%	27%	Pr. Pre-85	3%	2%	3%	3%	3%	Pr. Pre-85	4%	4%	5%	4%	4%	Pr. Pre-85	5%	2%	2%	2%	3%
Pr. Post-85	34%	53%	60%	61%	61%	Pr. Post-85	0%	2%	5%	7%	5%	Pr. Post-85	0%	2%	5%	8%	8%	Pr. Post-85	1%	2%	3%	3%	3%
Foreign	2%	2%	3%	3%	3%	Foreign	1%	1%	1%	1%	1%	Foreign	1%	2%	1%	1%	2%	Foreign	1%	1%	1%	0%	1%
<u>Food, Textile, & Paper Mfg.</u>						<u>Food, Textile, & Paper Mfg.</u>					<u>Food, Textile, & Paper Mfg.</u>					<u>Food, Textile, & Paper Mfg.</u>							
State	4%	3%	3%	3%	3%	State	50%	37%	36%	39%	38%	State	60%	52%	55%	57%	58%	State	47%	34%	37%	40%	43%
Pr. Pre-85	67%	51%	44%	42%	42%	Pr. Pre-85	41%	46%	40%	39%	40%	Pr. Pre-85	31%	33%	28%	25%	26%	Pr. Pre-85	42%	48%	42%	39%	40%
Pr. Post-85	25%	42%	49%	51%	52%	Pr. Post-85	1%	9%	19%	17%	16%	Pr. Post-85	1%	5%	10%	12%	11%	Pr. Post-85	1%	6%	10%	12%	9%
Foreign	3%	3%	4%	4%	3%	Foreign	7%	8%	6%	6%	6%	Foreign	8%	9%	8%	6%	5%	Foreign	10%	12%	10%	9%	9%
<u>Chemicals & Plastics Mfg.</u>						<u>Chemicals & Plastics Mfg.</u>					<u>Chemicals & Plastics Mfg.</u>					<u>Chemicals & Plastics Mfg.</u>							
State	3%	3%	2%	2%	2%	State	22%	15%	11%	9%	8%	State	15%	12%	9%	9%	8%	State	14%	12%	8%	4%	5%
Pr. Pre-85	62%	50%	44%	43%	43%	Pr. Pre-85	62%	64%	60%	56%	54%	Pr. Pre-85	62%	63%	58%	53%	53%	Pr. Pre-85	67%	65%	62%	55%	54%
Pr. Post-85	28%	41%	47%	48%	48%	Pr. Post-85	2%	10%	15%	18%	22%	Pr. Post-85	2%	7%	12%	16%	20%	Pr. Post-85	2%	7%	11%	16%	17%
Foreign	6%	6%	6%	7%	6%	Foreign	13%	11%	13%	16%	16%	Foreign	21%	18%	20%	22%	19%	Foreign	17%	15%	19%	25%	23%
<u>Metals and Industrial Mfg.</u>						<u>Metals and Industrial Mfg.</u>					<u>Metals and Industrial Mfg.</u>					<u>Metals and Industrial Mfg.</u>							
State	4%	4%	3%	3%	3%	State	51%	42%	29%	23%	24%	State	33%	28%	20%	17%	16%	State	38%	31%	24%	19%	26%
Pr. Pre-85	66%	55%	46%	44%	44%	Pr. Pre-85	39%	43%	47%	44%	43%	Pr. Pre-85	53%	53%	52%	46%	45%	Pr. Pre-85	50%	52%	53%	50%	44%
Pr. Post-85	24%	36%	44%	46%	46%	Pr. Post-85	1%	6%	11%	18%	18%	Pr. Post-85	1%	6%	11%	19%	20%	Pr. Post-85	1%	6%	9%	16%	14%
Foreign	6%	6%	7%	7%	7%	Foreign	9%	10%	13%	15%	15%	Foreign	12%	13%	16%	18%	19%	Foreign	11%	11%	14%	15%	15%
<u>Utilities, construc., retail</u>						<u>Utilities, construc., retail</u>					<u>Utilities, construc., retail</u>					<u>Utilities, construc., retail</u>							
State	7%	6%	5%	6%	6%	State	71%	76%	66%	73%	73%	State	59%	64%	60%	64%	63%	State	61%	73%	70%	76%	73%
Pr. Pre-85	63%	47%	36%	32%	32%	Pr. Pre-85	27%	21%	24%	15%	12%	Pr. Pre-85	35%	29%	26%	19%	17%	Pr. Pre-85	36%	24%	22%	14%	13%
Pr. Post-85	26%	43%	55%	58%	59%	Pr. Post-85	1%	3%	8%	10%	14%	Pr. Post-85	1%	4%	11%	14%	17%	Pr. Post-85	2%	3%	5%	8%	13%
Foreign	4%	4%	4%	4%	4%	Foreign	1%	1%	2%	2%	1%	Foreign	4%	3%	3%	3%	2%	Foreign	1%	1%	2%	2%	1%

Table 7 contd.

Table 7 Contd.

Number of Firm						Total Assets					Total Sales					Profits (PBDIT)							
	I	II	III	IV	V		I	II	III	IV	V		I	II	III	IV	V		I	II	III	IV	V
Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2007	Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2007	Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2007	Owner /Period	1988-1990	1991-1994	1995-1998	1999-2002	2003-2007
<u>Transport</u>						<u>Transport</u>						<u>Transport</u>						<u>Transport</u>					
State	18%	15%	14%	13%	11%	State	51%	74%	67%	59%	55%	State	55%	69%	66%	61%	57%	State	42%	61%	62%	58%	50%
Pr. Pre-85	56%	44%	33%	29%	27%	Bus. G.	46%	22%	21%	14%	16%	Bus. G.	43%	26%	19%	18%	19%	Bus. G.	57%	36%	26%	18%	21%
Pr. Post-85	21%	34%	46%	52%	55%	Private	2%	3%	6%	16%	18%	Private	1%	4%	7%	10%	12%	Private	1%	3%	6%	17%	14%
Foreign	5%	7%	7%	6%	7%	Foreign	0%	1%	5%	11%	11%	Foreign	1%	1%	8%	11%	12%	Foreign	0%	1%	6%	8%	14%
<u>Hospitality, Tour., Media, Health, & Other</u>						<u>Hospitality, Tour., Media, Health, & Other</u>						<u>Hospitality, Tour., Media, Health, & Other</u>						<u>Hospitality, Tour., Media, Health, & Other</u>					
State	5%	4%	3%	3%	3%	State	5%	9%	5%	3%	3%	State	7%	14%	12%	7%	5%	State	3%	8%	6%	2%	1%
Pr. Pre-85	59%	45%	34%	29%	28%	Bus. G.	89%	71%	66%	63%	51%	Bus. G.	88%	71%	64%	51%	46%	Bus. G.	90%	75%	75%	66%	59%
Pr. Post-85	31%	47%	59%	64%	65%	Private	2%	14%	23%	29%	41%	Private	1%	7%	15%	34%	41%	Private	1%	9%	12%	26%	33%
Foreign	5%	4%	4%	4%	4%	Foreign	4%	7%	6%	5%	5%	Foreign	4%	7%	8%	7%	8%	Foreign	6%	9%	7%	7%	7%
<u>Financial services, real estate</u>						<u>Financial services, real estate</u>						<u>Financial services, real estate</u>						<u>Financial services, real estate</u>					
State	7%	5%	5%	5%	5%	State	93%	83%	76%	74%	72%	State	8%	12%	12%	7%	7%	State	89%	78%	71%	74%	70%
Pr. Pre-85	67%	49%	38%	36%	36%	Bus. G.	5%	9%	12%	9%	8%	Bus. G.	89%	81%	79%	84%	76%	Bus. G.	8%	14%	16%	11%	11%
Pr. Post-85	24%	43%	54%	56%	56%	Private	0%	2%	5%	10%	13%	Private	2%	6%	9%	8%	15%	Private	1%	3%	5%	8%	12%
Foreign	3%	3%	3%	3%	3%	Foreign	2%	6%	7%	7%	7%	Foreign	2%	1%	1%	0%	1%	Foreign	2%	6%	8%	7%	7%
<u>Business, Comp., & Comm. services</u>						<u>Business, Comp., & Comm. services</u>						<u>Business, Comp., & Comm. services</u>						<u>Business, Comp., & Comm. services</u>					
State	5%	4%	3%	2%	2%	State	80%	71%	40%	57%	51%	State	56%	41%	26%	42%	36%	State	74%	65%	50%	58%	53%
Pr. Pre-85	58%	37%	24%	19%	18%	Bus. G.	11%	10%	11%	7%	8%	Bus. G.	32%	22%	20%	15%	16%	Bus. G.	11%	10%	12%	11%	12%
Pr. Post-85	29%	51%	65%	70%	71%	Private	8%	16%	42%	29%	34%	Private	10%	34%	48%	33%	37%	Private	14%	22%	34%	24%	25%
Foreign	7%	8%	9%	9%	8%	Foreign	1%	2%	7%	6%	7%	Foreign	2%	4%	7%	10%	11%	Foreign	0%	3%	4%	7%	9%
<u>Misc. diversified</u>						<u>Misc. diversified</u>						<u>Misc. diversified</u>						<u>Misc. diversified</u>					
State	2%	1%	1%	1%	1%	State		6%	6%	6%	5%	State	14%	6%	7%	7%	6%	State	12%	5%	5%	2%	1%
Pr. Pre-85	63%	45%	30%	26%	24%	Bus. G.	80%	80%	74%	69%	65%	Bus. G.	68%	74%	70%	66%	65%	Bus. G.	75%	78%	75%	67%	71%
Pr. Post-85	32%	51%	67%	70%	72%	Private	4%	11%	18%	22%	26%	Private	6%	12%	18%	20%	22%	Private	5%	12%	16%	22%	20%
Foreign	3%	3%	3%	3%	3%	Foreign	4%	3%	2%	3%	3%	Foreign	12%	8%	5%	8%	8%	Foreign	8%	6%	4%	10%	7%
<u>Full Sample: All Industries</u>						<u>Full Sample: All Industries</u>						<u>Full Sample: All Industries</u>						<u>Full Sample: All Industries</u>					
Agri., Min.	2%	3%	3%	3%	3%	Agri., Min.	3%	5%	3%	3%	3%	Agri., Min.	4%	5%	5%	5%	5%	Agri., Min.	3%	7%	6%	6%	8%
Food,Text.	17%	16%	15%	14%	13%	Food,Text.	10%	8%	9%	8%	8%	Food,Text.	30%	27%	29%	33%	29%	Food,Text.	16%	11%	10%	11%	12%
Chem.r	16%	15%	13%	12%	12%	Chem.r	11%	8%	8%	6%	5%	Chem.r	20%	19%	18%	14%	13%	Chem.r	16%	12%	9%	8%	8%
Metals.	19%	17%	16%	15%	14%	Metals.	19%	14%	12%	9%	8%	Metals.	28%	26%	24%	20%	22%	Metals.	21%	15%	12%	9%	13%
Util., Cons.	12%	12%	13%	14%	14%	Util., Cons.	9%	11%	10%	11%	12%	Util., Cons.	11%	15%	16%	18%	20%	Util., Cons.	8%	11%	10%	12%	12%
Trans.	2%	2%	2%	2%	2%	Trans.	1%	2%	1%	2%	1%	Trans.	1%	2%	2%	2%	2%	Trans.	1%	2%	1%	2%	2%
Hosp.	3%	3%	3%	4%	4%	Hosp.	0%	0%	1%	1%	1%	Hosp.	0%	0%	1%	1%	1%	Hosp.	0%	0%	1%	1%	1%
Finan.	24%	25%	27%	26%	27%	Finan.	43%	50%	53%	55%	55%	Finan.	2%	1%	1%	1%	1%	Finan.	31%	39%	46%	45%	36%
Bus. Comp.	4%	5%	6%	8%	8%	Bus. Comp	1%	1%	2%	5%	5%	Bus. Comp	1%	2%	3%	5%	6%	Bus. Comp.	2%	2%	3%	7%	9%
Misc.	2%	2%	3%	3%	3%	Misc.	1%	1%	1%	0.5%	0.4%	Misc.	3%	2%	2%	1%	1%	Misc.	2%	1%	1%	0%	1%

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 8: Year of Incorporation

	I	II	III	IV	V
Incorporation/Period	1988-1990	1991-1995	1996-1998	1999-2002	2003-2007
<u>Pre-independence</u>					
Number of firms	1,018	1,002	950	883	785
Assets (Rs. Crore)	162	285	367	436	445
Sales (Rs. Crore)	91	67	79	73	67
PBDIT (Rs. Crore)	15	23	32	36	33
ROA	11	11	10	5	-1
<u>c1947-1985</u>					
Number of firms	1,177	1,159	1,098	1,022	912
Assets (Rs. Crore)	135	102	120	126	122
Sales (Rs. Crore)	80	48	58	61	65
PBDITA (Rs. Crore)	13	10	13	12	13
ROA	13	12	9	5	6
<u>c1985-2007</u>					
Number of firms	365	827	1,293	1,357	1,268
Assets (Rs. Crore)	101	27	34	52	48
Sales (Rs. Crore)	25	7	11	19	18
PBDIT (Rs. Crore)	10	3	3	5	4
ROA	10	8	6	2	-1

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 9: The Evolution of Firm Size and Market Concentration (Constant Rs. Crore)

	1989-1990	1991-1995	1996-1998	1999-2002	2003-2007
Full Sample					
<i>Herfindahl Index</i>	0.43	0.38	0.33	0.32	0.31
Firm Profits	13.39	12.21	11.88	12.21	10.85
Firm Size (Assets Rs. Crore)	137.66	126.20	118.23	132.55	116.65
Firm Size (Sales Rs. Crore)	85.62	49.79	43.41	47.10	43.34
Coefficient of Variation of Firm Size	2.09	2.77	3.71	4.17	4.78
Coefficient of Variation of Firm Size	1.99	3.55	5.51	6.24	9.83
Number of Firms	11394	14608	17544	17767	16318
Number of Industries	115	116	119	122	121
State-Owned Firms					
Coefficient of Variation of Firm Size	2.02	2.63	3.39	3.78	4.21
Coefficient of Variation of Firm Size	1.89	3.55	5.67	5.97	8.59
Number of Firms	645	661	691	692	636
Number of Industries	81	82	85	85	84
Private Firms (before 1985)					
Coefficient of Variation of Firm Size	2.19	2.88	3.83	4.28	4.82
Coefficient of Variation of Firm Size	2.08	3.67	5.61	6.38	10.12
Number of Firms	7564	7436	7035	6552	5843
Number of Industries	111	111	111	111	111
Private Firms (after 1985)					
Coefficient of Variation of Firm Size	2.04	2.73	3.71	4.18	4.86
Coefficient of Variation of Firm Size	1.94	3.52	5.51	6.27	9.97
Number of Firms	2664	5858	8983	9646	9069
Number of Industries	103	110	115	118	118
Foreign Firms					
Coefficient of Variation of Firm Size	1.91	2.45	3.13	3.44	3.96
Coefficient of Variation of Firm Size	1.85	3.06	4.65	5.01	7.00
Number of Firms	521	654	835	877	771
Number of Industries	76	81	89	90	88

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables.

Table 10a: The Evolution of Firm Size and Market Concentration--FDI Deregulation (Constant Rs. Crore)

	Before FDI Deregulation	After FDI Deregulation
	Full Sample	
<i>Herfindahl Index</i>	0.26	0.20
Coefficient of Variation of Firm Size (Assets)	1.95	2.32
Coefficient of Variation of Firm Size (Sales)	1.86	2.36
Number of Firms	5241	6434
Number of Industries	43	43
	State-Owned Firms	
Coefficient of Variation of Firm Size (Assets)	2.02	2.36
Coefficient of Variation of Firm Size (Sales)	1.91	2.35
Number of Firms	198	193
Number of Industries	33	33
	Private (Inc. pre-1985)	
Coefficient of Variation of Firm Size (Assets)	2.05	2.39
Coefficient of Variation of Firm Size (Sales)	1.94	2.38
Number of Firms	3495	3402
Number of Industries	43	43
	Private (Inc. post-1985)	
Coefficient of Variation of Firm Size (Assets)	1.88	2.27
Coefficient of Variation of Firm Size (Sales)	1.80	2.35
Number of Firms	1228	2458
Number of Industries	40	42
	Foreign Firms	
Coefficient of Variation of Firm Size (Assets)	1.84	2.23
Coefficient of Variation of Firm Size (Sales)	1.83	2.32
Number of Firms	321	381
Number of Industries	35	37

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables. This table provides descriptive statistics of the "before-after" effect of foreign direct investment liberalization on the market share and profitability of firms and concentration ratios in liberalized industries. The sample is restricted to industries that deregulated foreign investment and to two years before (1989-1990) and two years after (1992-1993) the policy was implemented in 1991.

Table 10b: The Evolution of Firm Size and Market Concentration--Trade Liberalization (Constant Rs. Crore)

	Before Trade liberalization	After Trade Liberalization
	Full Sample	
<i>Herfindahl Index</i>	0.32	0.28
Coefficient of Variation of Firm Size (Assets)	2.27	2.57
Coefficient of Variation of Firm Size (Sales)	2.09	2.48
Number of Firms	4255	5110
Number of Industries	35	35
	State-Owned Firms	
Coefficient of Variation of Firm Size (Assets)	2.23	2.55
Coefficient of Variation of Firm Size (Sales)	2.06	2.44
Number of Firms	182	181
Number of Industries	28	28
	Private (Inc. pre-1985)	
Coefficient of Variation of Firm Size (Assets)	2.32	2.61
Coefficient of Variation of Firm Size (Sales)	2.13	2.50
Number of Firms	2784	2701
Number of Industries	34	34
	Private (Inc. post-1985)	
Coefficient of Variation of Firm Size (Assets)	2.24	2.54
Coefficient of Variation of Firm Size (Sales)	2.05	2.47
Number of Firms	1055	1959
Number of Industries	32	34
	Foreign Firms	
Coefficient of Variation of Firm Size (Assets)	2.18	2.48
Coefficient of Variation of Firm Size (Sales)	2.10	2.49
Number of Firms	234	270
Number of Industries	28	29

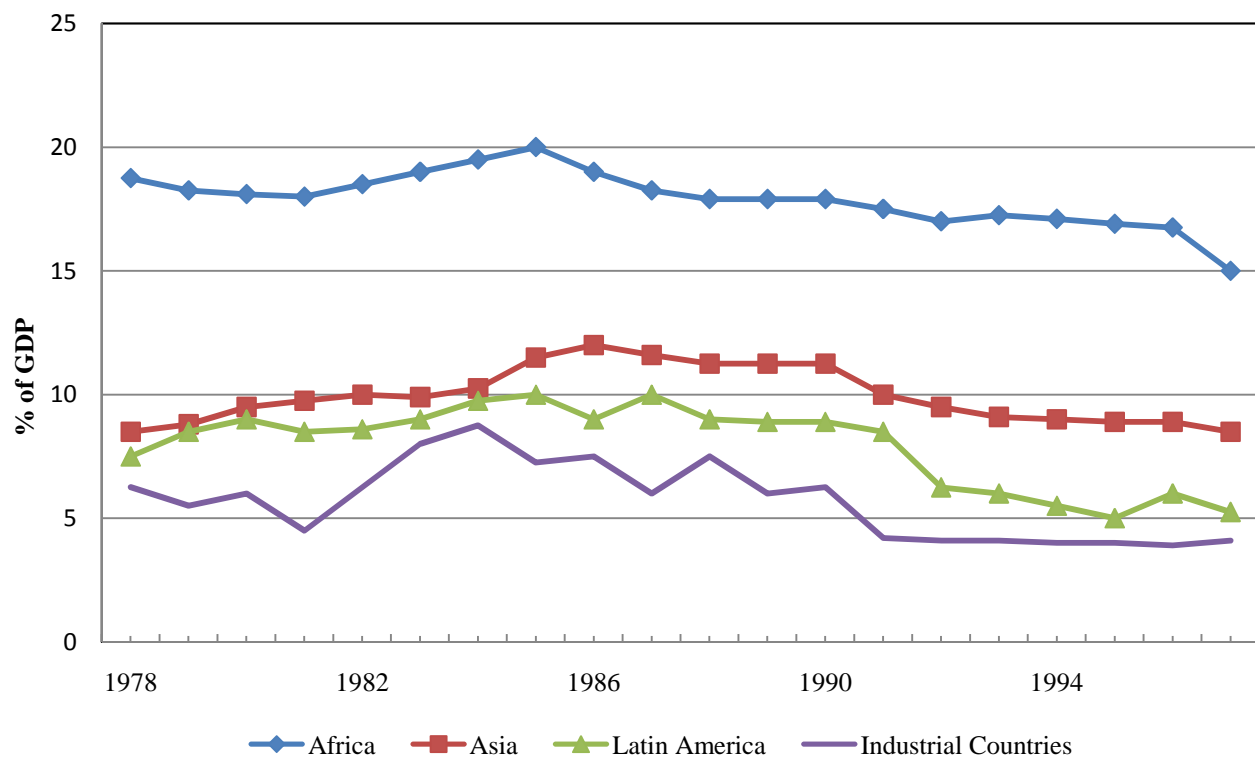
Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables. This table provides descriptive statistics of the "before-after" effect of foreign direct investment liberalization on the market share and profitability of firms and concentration ratios in liberalized industries. The sample is restricted to industries that deregulated foreign investment and to two years before (1989-1990) and two years after (1992-1993) the policy was implemented in 1991.

Table 10c: The Evolution of Firm Size and Market Concentration--Domestic Delicensing (Constant Rs. Crore)

	Before Domestic Delicensing	After Domestic Delicensing
	Full Sample	
<i>Herfindahl Index</i>	0.35	0.24
Coefficient of Variation of Firm Size (Assets)	1.57	2.03
Coefficient of Variation of Firm Size (Sales)	1.54	1.93
Number of Firms	3158	3789
Number of Industries	24	24
	State-Owned Firms	
Coefficient of Variation of Firm Size (Assets)	1.73	2.11
Coefficient of Variation of Firm Size (Sales)	1.63	1.94
Number of Firms	131	124
Number of Industries	16	16
	Private (Inc. pre-1985)	
Coefficient of Variation of Firm Size (Assets)	1.60	2.03
Coefficient of Variation of Firm Size (Sales)	1.59	1.94
Number of Firms	2139	2083
Number of Industries	24	24
	Private (Inc. post-1985)	
Coefficient of Variation of Firm Size (Assets)	1.54	2.03
Coefficient of Variation of Firm Size (Sales)	1.48	1.90
Number of Firms	705	1374
Number of Industries	32	34
	Foreign Firms	
Coefficient of Variation of Firm Size (Assets)	1.49	1.89
Coefficient of Variation of Firm Size (Sales)	1.58	2.07
Number of Firms	181	204
Number of Industries	17	18

Source: Prowess Data Set. See Appendix Tables A1 and A2 for detailed explanation of variables. This table provides descriptive statistics of the "before-after" effect of foreign direct investment liberalization on the market share and profitability of firms and concentration ratios in liberalized industries. The sample is restricted to industries that deregulated foreign investment and to two years before (1989-1990) and two years after (1992-1993) the policy was implemented in 1991.

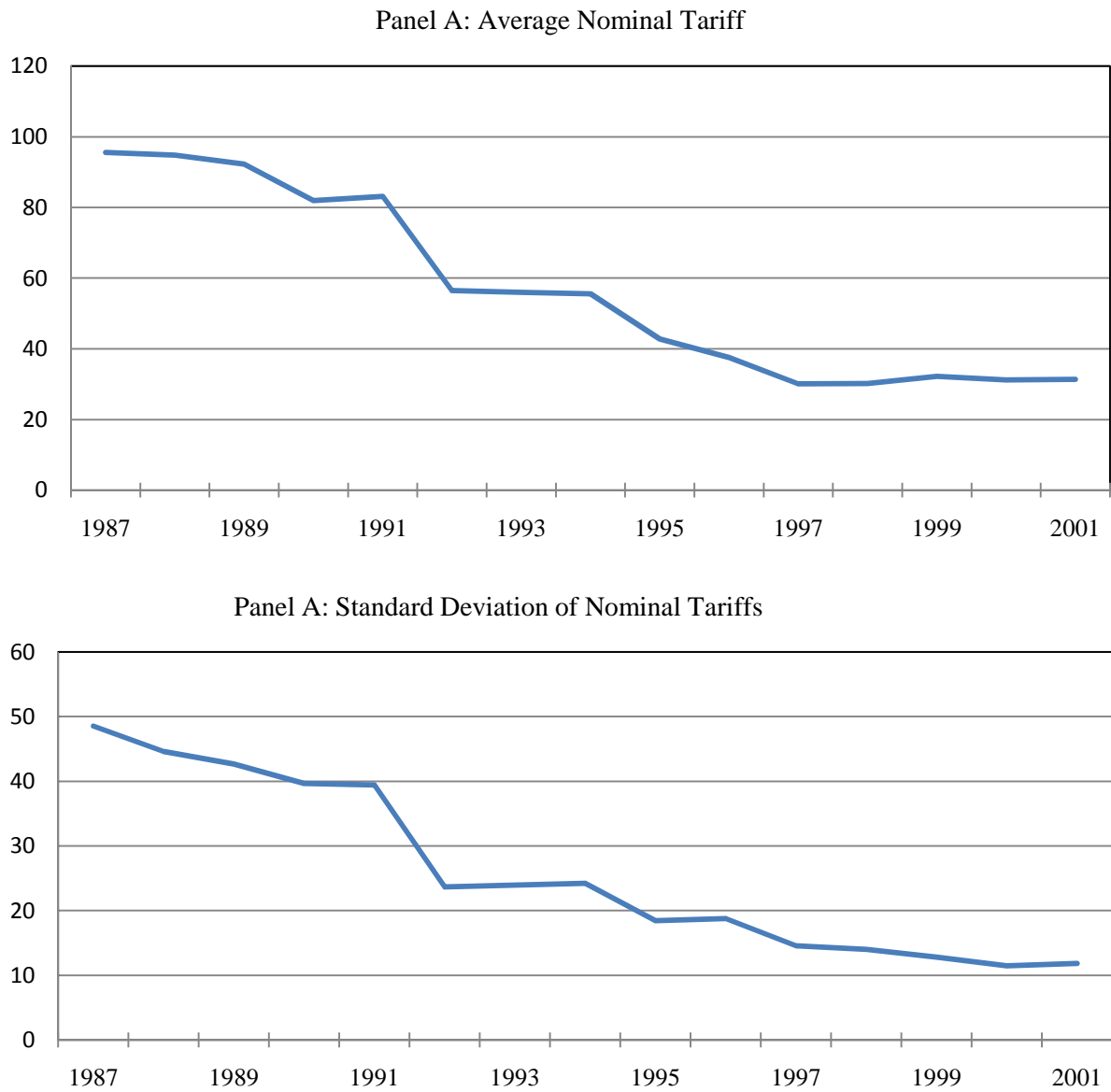
Figure 1: Economic Activity of State-Owned Enterprises, 1978-1997 (Percentage of GDP)



Notes: Weighted Average.

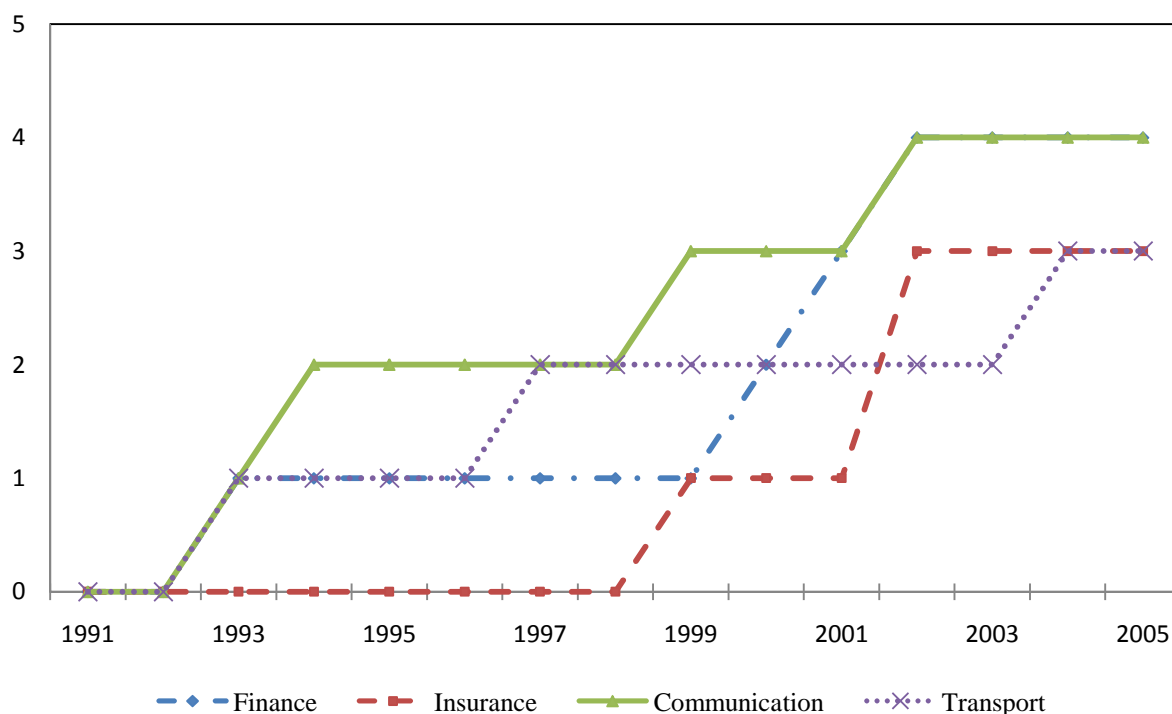
Source: World Bank (2001a) taken from Chong and Lopez-de-Silanes (2004).

Figure 2: Trade Reform in India, 1987-2001



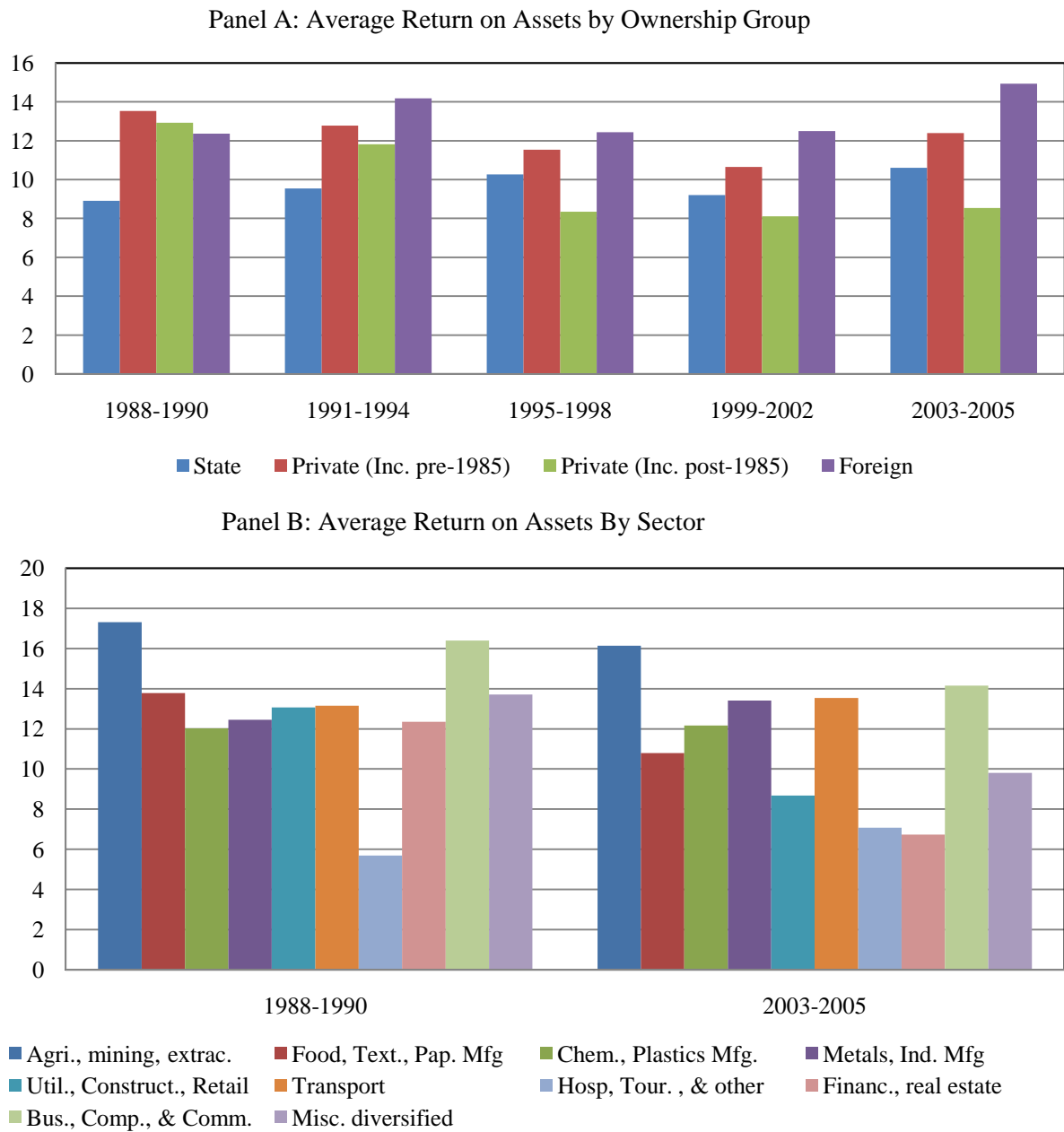
Taken from Topalova (2004).

Figure 3: Service Liberalization 1991-2005



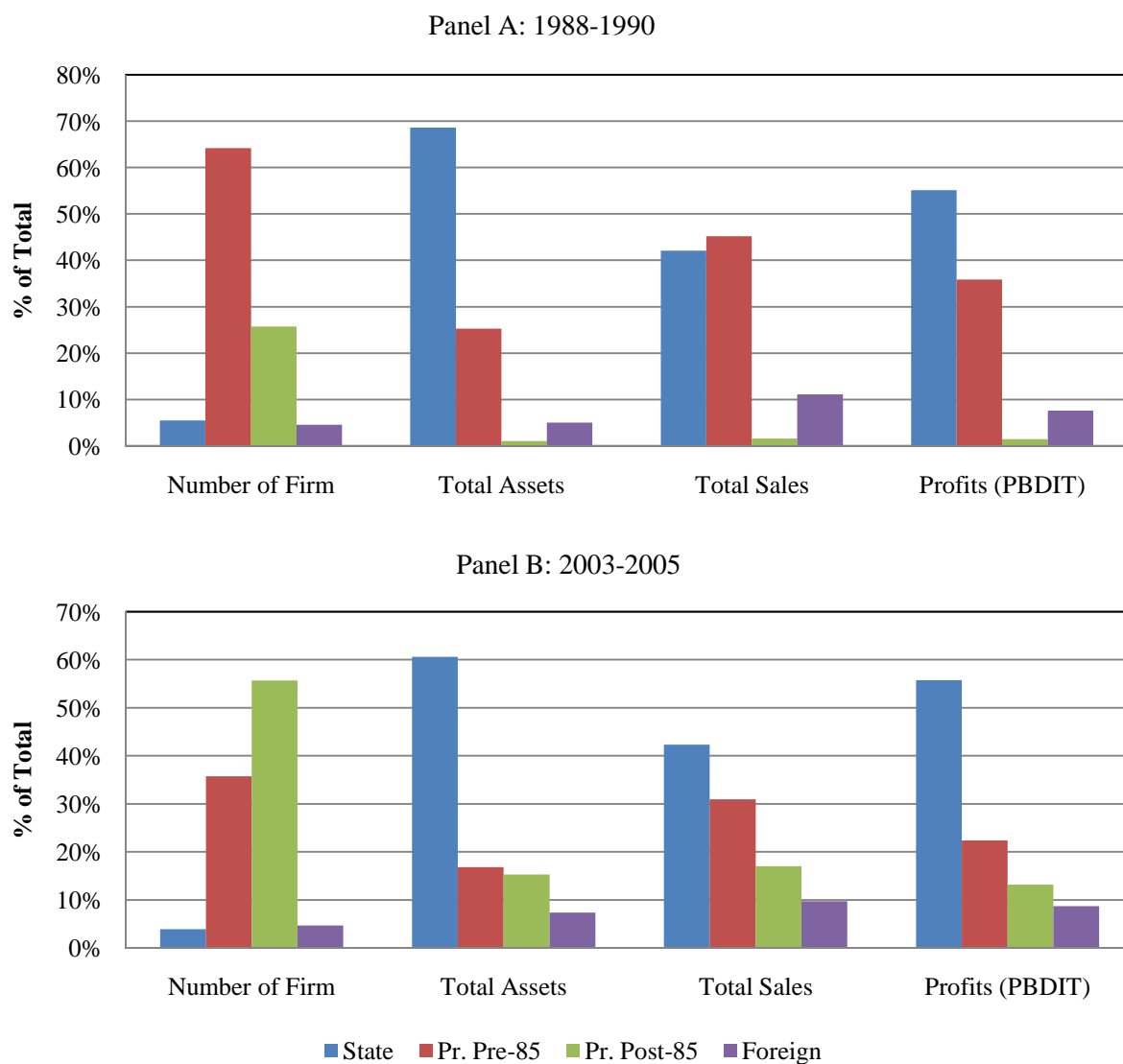
Notes: Taken from Arnold, Javorcik, Lipscombe and Mattoo (2008). Index values: 0: Almost no reform, the public sector is either the only relevant provider of services or has a strong grip on private providers. 1: some scope for private sector participation and some liberalization of operational decisions, combined with very limited scope for foreign participation (limited, for example, by low FDI ceilings or announced only as intentions). 2: limited degree of interference in operational decisions by public authorities, substantial price liberalization, and clear scope for foreign participation even if only in narrowly defined segments and as minority participations. However, the state remains a dominant actor in the sector. 3: significant scope for private providers, including foreign ones, a noticeable competitive pressure from new entrants on the public incumbents, and explicit possibilities for foreign equity participation. 4: little public intervention into the freedom of operation of private providers, the possibility of majority foreign ownership, and the dominance of private sector entities. 5: would be equal treatment of foreign and domestic providers, full convergence of regulation with international standards and unrestricted entry into the sector.

Figure 4: Average Return on Assets



Source: Prowess Data Set.

Figure 5: Number of Firms, Assets, Sales and Profits by Ownership Group (Share of Total)



Source: Prowess Data Set.